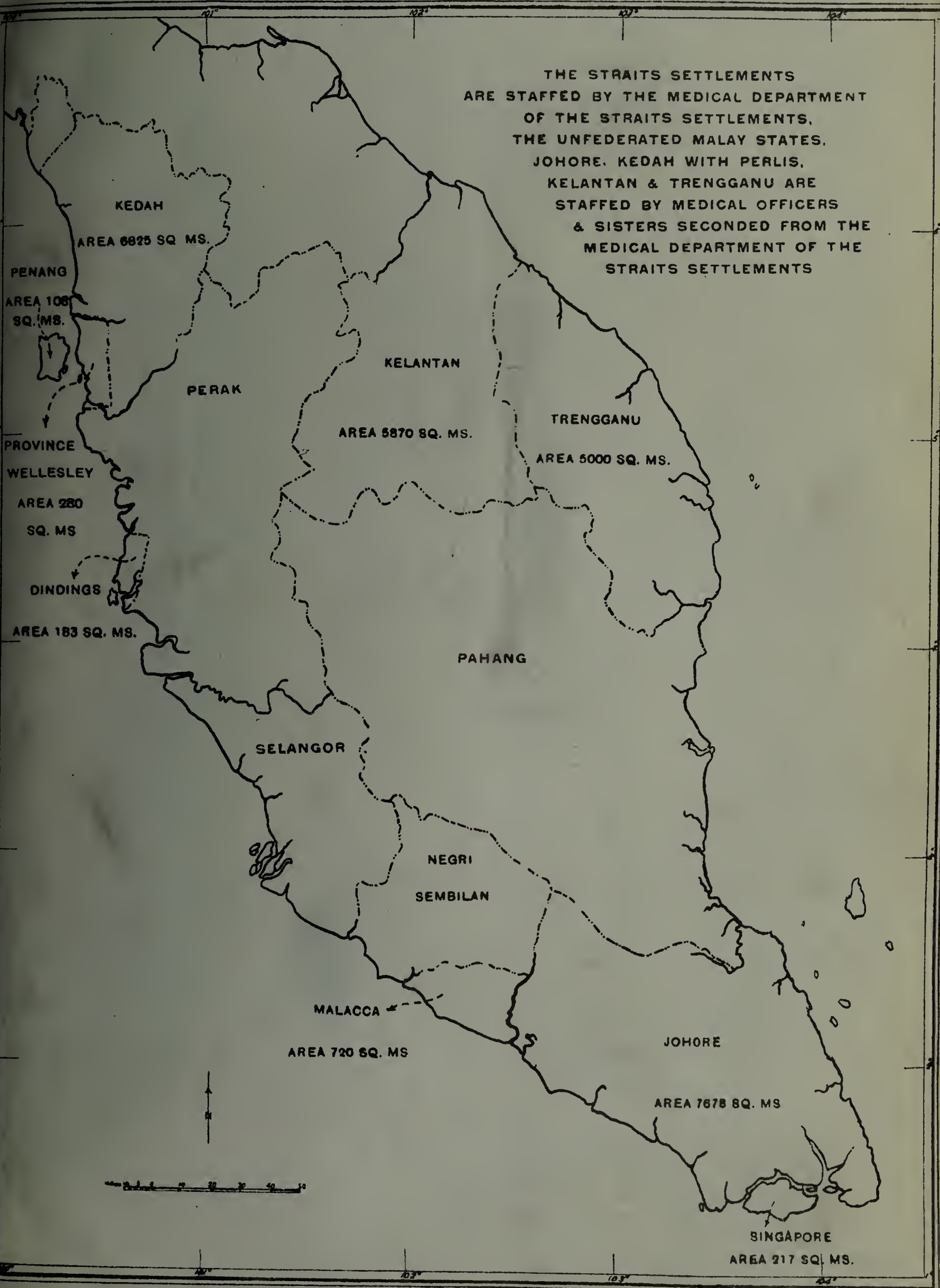


AC. 226.

THE STRAITS SETTLEMENTS
ARE STAFFED BY THE MEDICAL DEPARTMENT
OF THE STRAITS SETTLEMENTS.
THE UNFEDERATED MALAY STATES.
JOHORE. KEDAH WITH PERLIS.
KELANTAN & TRENGGANU ARE
STAFFED BY MEDICAL OFFICERS
& SISTERS SECONDED FROM THE
MEDICAL DEPARTMENT OF THE
STRAITS SETTLEMENTS



STRAITS SETTLEMENTS.

Annual Medical Report, 1927.

The report is a long one, a map and graphs have been included also some photographs. The model has been followed in parts, there are a number of tables and district reports which are largely of interest locally only.

The general remarks do not give a very clear review of the health and progress for the year.

Dr. A.L. Hoops, the P.C.M.O. was away in India and on leave during the latter part of the year and did not write the report.

P.5.

Public Health.

The year was generally unhealthy both in the Straits and in the rest of Malaya. Death rates from Malaria and Pneumonia were above the average.

Deaths from Pneumonia were 3,253 against 2,807 in 1926 and over 1000 more deaths registered from Convulsions.

There were only 3 deaths from plague in the Municipal area.

117 cases of small-pox with 26 deaths.

96,172 vaccinations were performed.

Tuberculosis showed a slight increase and appears to be spreading.

The campaign against venereal diseases was energetically carried on through the Social Hygiene Office at Singapore, pamphlets and leaflets were distributed and two films exhibited.

P.9.

P.9. Vital Statistics.

The crude birth rate was 35.27 per mille against 32.85 in 1926.

Crude death rate was 35.55 per mille against 31.81, it was the highest since 1918, when there was the influenza epidemic.

P.15.

The Island was divided into 5 Sanitary Districts in 1929 for administration, very considerable difficulty was found in providing Sanitary Inspectors for these new divisions. The Royal Sanitary Institute agreed to recognise the local training of candidates and a Joint Diploma was issued. 3 obtained the Diploma.

P.17.

A preliminary mosquito survey and maps were made of the whole rural area. A vote of 2120,000 was granted for anti-malarial measures.

P.18.

22 incinerators were built in rural areas.

A travelling dispensary was started during the year, also a child welfare campaign was inaugurated.

P.20.

School Inspection was carried out under the charge of a Lady Medical Officer over 10,000 pupils examined.

P.23.

Child Welfare work was energetically carried on.

The infant mortality rate was 262.3 per 1000 for the year.

Dr. G.E. Brookes the Chief Health Officer Singapore is retiring after 30 years Government Service.

P.133.

A comprehensive report on the rural sanitation campaign is written by Dr. Paul Russell of the Rockefeller Foundation.

(Intd.). G.J.R.

24.1.29.

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STRAITS SETTLEMENTS

Paper to be laid before the Legislative Council by Command of
His Excellency the Officer Administering the Government

The Straits Settlements Medical Report for the year 1927.

I.—ADMINISTRATION

(a) STAFF

1. The authorised number of the European Staff for 1927 was 131.

2. The following officers were promoted or appointed to posts above the time-scale during the year.

<i>Name</i>	<i>Previous Post</i>	<i>Appointment</i>	<i>Date</i>
J. S. WEBSTER	Professor of Medicine	Radiologist, S. S	23-4-1927
W. M. CHAMBERS	Time-scale Medical Officer, S. S.	Chief Medical Officer, Social Hygiene	1-1-1927
W. A. YOUNG	...	Professor of Bacteriology, College of Medicine, Singapore	10-3-1927
J. L. ROSEDALE	...	Professor of Bio-Chemistry, College of Medicine, Singapore	22-4-1927
R. B. HAWES	Time-scale Medical Officer, S. S.	Professor of Medicine, College of Medicine, Singapore	23-4-1927

3. The following medical officers were appointed to the service after passing through the London School of Tropical Medicine

<i>Name</i>	<i>Date of Arrival</i>
Dr. R. D. GROSS ...	... 10th April, 1927
Dr. J. M. A. LOWSON ...	... 3rd May, 1927
Dr. A. BARNSELY ...	... 7th May, 1927
Dr. (Miss) K. M. HYSLOP	... 24th August, 1927
Dr. T. C. LONIE ...	... 27th August, 1927
Dr. R. WALKINGSHAW ...	... 27th August, 1927
Dr. D. E. IAGO-JONES ...	... 23rd September, 1927
Dr. J. V. LANDAU ...	... 23rd September, 1927
Dr. J. W. WINCHESTER	... 22nd October, 1927
Dr. (Miss) E. M. BIRD	... 22nd October, 1927

Dr. (Mrs.) N. M. H. CLARKE was engaged locally as a Lady Medical Officer for temporary duty on 14th February, 1927.

4. The following officers proceeded on leave during the year:—

<i>Name</i>	<i>Appointment</i>	<i>Date</i>
Dr. G. H. GARLICK	... Medical Officer, Johore	... 3rd January, 1927
Dr. J. W. ADAMS	... Surgeon, Penang	... 17th February, 1927
Mr. J. C. COWAP	... Government Analyst, S. S.	... 22nd April, 1927
Dr. J. I. BAEZA	... Health Officer, Kedah	... 23rd April, 1927
Dr. W. J. E. PHILLIPS	... Medical Officer, Johore	... 6th May, 1927
Dr. E. D. LINDOW	... Medical Officer, Singapore	... 3rd June, 1927
Dr. R. W. C. KELLY	... Medical Officer, Singapore	... 1st July, 1927
Dr. E. V. LUPPRIAN	... Medical Officer, Penang	... 4th July, 1927
Dr. R. D. FITZGERALD	... Principal Medical Officer, Johore	... 24th December, 1927

Dr. A. L. HOOPS, Principal Civil Medical Officer, Straits Settlements, sailed for India on 24th November, 1927, to attend the VII Congress of the Far Eastern Association of Tropical Medicine and the Council Meeting of the League of Nations Eastern Bureau.

5. The following officers returned from leave during the year:—

<i>Name</i>	<i>Appointment</i>	<i>Date</i>
Dr. J. G. HARROWER	... Professor of Anatomy, College of Medicine, Singapore	... 26th January, 1927
Mr. M. JAMIESON	... Assistant Analyst, Singa- pore	... 14th March, 1927
Mr. A. D. WRIGHT	... Professor of Clinical Sur- gery, College of Medi- cine, Singapore	... 25th March, 1927
Dr. J. PORTELLI	... Health Officer, Johore	... 10th April, 1927
Dr. J. GRAY	... Chief Medical Officer, Singapore	... 12th April, 1927
Dr. R. B. HAWES	... Professor of Medicine, College of Medicine, Singapore	... 23rd April, 1927
Dr. G. E. BROOKE	... Chief Health Officer, Singa- pore	... 9th May, 1927
Dr. L. W. EVANS	... Chief Medical Officer, Kelantan	... 15th August, 1927
Dr. J. W. ADAMS	... Surgeon, Penang	... 8th November, 1927
Dr. G. H. GARLICK	... Medical Officer, Johore	... 22nd November, 1927
Mr. J. C. COWAP	... Government Analyst, S. S.	... 17th December, 1927
Dr. J. I. BAEZA	... Health Officer, Kedah	... 28th December, 1927

6. The following officers were invalided during the year:—

<i>Name</i>	<i>Appointment</i>	<i>Date</i>
Dr. D. ARCHIBALD	... Medical Officer, Penang	... 29th March, 1927
Dr. W. A. TAYLOR	... Chief Medical Officer, Penang	... 29th September, 1927
Dr. E. E. CLAXTON resigned on 17th February, 1927.		
Dr. J. J. KEEVIL resigned on 12th April, 1927.		

7. The following officers were seconded for service in the Unfederated Malay States during the year:—

<i>Name</i>	<i>To</i>	<i>Date</i>
Dr. J. PORTELLI	... Johore as Health Officer	... 11th April, 1927
Dr. D. I. GRACEY	... Johore as Medical Officer	... 30th August, 1927
Dr. A. S. M. DOUGLAS	... Kedah as Medical Officer	... 5th November, 1927
Dr. T. C. LONIE	... Kelantan as Health Officer	... 9th November, 1927

Dr. (Miss) K. M. HYSLOP, who was seconded for Service under the Government of Kedah on 24th August, 1927, exchanged duties with Dr. (Miss) C. B. KIBBLE, Lady Medical Officer, Federated Malay States.

8. *European Matrons and Sisters*.--Miss R. FENOULHET was promoted Matron, General Hospital, Singapore, *vice* Miss ELIZABETH FLETCHER, deceased.

9. The local medical service numbered 68, mostly graduates of the King Edward VII College of Medicine, Singapore.

10. Colonel NEEDHAM who inspected the College of Medicine, Singapore, in the latter part of 1926, has reported well on the College.

(b) THE FOLLOWING ORDINANCES AFFECTING PUBLIC HEALTH WERE ENACTED DURING THE YEAR

1. An Ordinance to consolidate and amend the law with regard to Deleterious Drugs (cited as the Deleterious Drugs Ordinance, 1927).

The objects and reasons were to amend the law relating to deleterious drugs so as to embody in it such of the provisions of the International Opium Convention signed at Geneva on the 19th February, 1925, as are applicable to the Colony.

The principal amendments are the following:—

- (1) The *bonâ fide* traveller who is in possession of deleterious drugs will no longer enjoy exemption from any of the provisions of the Ordinance.
- (2) Not merely the importing and exporting of deleterious drugs, but also the doing of any act preparatory to or for the purpose of importing or exporting the same is punishable—(section 13).
- (3) Drugs brought into the Colony in course of transit to a destination outside the Colony must be accompanied by a document, or duly authenticated copy of a document, issued in respect thereof by the Government of a country which is a party to the Convention. If, however, the country from which such drugs are brought is not a party to the Convention, discretion is given to the Colonial Secretary to dispense with such document—(section 13).
- (4) A person who has in his possession any thing containing a deleterious drug, or any document of title relating to any thing containing a deleterious drug, is presumed to know the nature of such drug—(section 17).
- (5) Traffic in deleterious drugs, whether the drugs be in the Colony or elsewhere, and whether they be ascertained or appropriated or in existence or not, is prohibited, except under licence—(section 21).
- (6) The dried tops of the plant *Cannabis Sativa* and galenical preparations thereof are included in the list of deleterious drugs and become subject to the general provisions of the Ordinance, but the cultivation of the plant itself and possession of any part of the plant, other than the dried tops, and of resin extracted from the plant is absolutely prohibited—(section 22 and First Schedule).
- (7) The manufacture of deleterious drugs, except under a licence, is prohibited. Licensees are required to keep books showing the quantities of drugs manufactured by them and the manner in which such drugs have been distributed—(section 26).
- (8) Power is taken to exempt from those provisions of the Ordinance which relate to the manufacture, possession, distribution and use of deleterious drugs, within the Colony, any preparation containing deleterious drugs which by reason of its constituents is unlikely to be put to other than strictly medical uses—(section 41).
- (9) Power is taken to exempt from all the provisions of the Ordinance any preparation containing any deleterious drug to which the Convention ceases to apply by reason of a finding of the Health Committee of the League of Nations that such preparation cannot give rise to the drug habit—(section 47).

- (10) The restrictions hitherto existing as to the importation, possession, sale, etc., of hypodermic syringes are removed as unnecessarily interfering with the legitimate use of such syringes.
- (11) As the law stood, if a ship was used for the importation or exportation or for the receipt and storage of deleterious drugs contrary to the Ordinance, the master and owner were liable to a penalty, unless it were proved that none of the ship's company was implicated in placing or keeping the drug in the ship. Under the Ordinance, the master or owner are not now liable, if it is proved that he himself was not implicated in the placing or keeping of the drug in the ship and the offence was committed without his knowledge, consent or connivance.

2. An Ordinance to provide for the improvement of the Town and Island of Singapore.

The object of this Ordinance is to constitute a Board of Trustees with power to take measures for the improvement of the Town and Island of Singapore, with particular reference to housing accommodation, means of communication and insanitary areas. The Board consists of four ex-officio Trustees, namely, the President, Municipal Commissioners, Treasurer, Colonial Engineer and Municipal Health Officer, of four nominated Trustees and of a Manager, who is also a Trustee. The Board's normal method of procedure is by improvement schemes. Such schemes are to be prepared by the Board, advertised and, after objections lodged by persons interested have been considered, submitted to the Governor in Council, and if approved carried into execution by the Board or by some other authority named in the scheme, or, possibly, by persons whose property is affected by it.

It is the duty of the Board to prepare plans of the whole of the Town and Island of Singapore, showing all principal means of communication which are in existence and all building schemes authorised, regular lines of streets prescribed and back-lanes set apart or ordered to be laid out under Ordinance No. 135 (Municipal).

(c) FINANCIAL

The actual medical and sanitary expenditure and the revenue collected in the various settlements were:—

1927						
EXPENDITURE					\$	c.
Singapore	...	...	...	...	2,510,926	63
Penang	...	...	...	...	1,000,396	59
Malacca	...	...	...	...	300,708	25
Labuan	...	...	...	...	18,460	18
Total					3,830,491	65

1927					\$	c.	
REVENUE							
Singapore	371,792	73	including payments for lepers.
Penang	...	...	...	...	206,113	67
Malacca	...	...	...	...	23,815	90
Labuan	...	...	...	...	1,976	60
Total					603,698	90	

Of the expenditure \$676,936.45 was spent on the Health Branch and \$172,562.59 on the College of Medicine, Singapore.

It is to be remembered that in addition to the above, the Health Services of the Municipalities spent:—

					\$	c.
Singapore	...	...	...	...	800,306	48
Penang	...	...	...	...	141,320	13
Malacca	...	...	...	...	26,700	00
Total ..					968,326	61

The total revenue of the Colony was \$32,916,345.

Further particulars are given in Table II.

II.—PUBLIC HEALTH

General Remarks:—

The year was, like the year 1926, not only in the Straits Settlements but generally throughout Malaya, unhealthy. With better rains in the first quarter of the year Malaria diseases slightly decreased. With hot and dry weather from June to September, the death-rates from Malaria, Pneumonia and Infantile Mortality were still above the average.

It is to be noted that the troubled condition in China has greatly assisted to swell the Chinese immigrants from China. The figures rose from 348,573 in 1926 to 359,262 in 1927. Only 204,064 deck passengers returned to China.

It is worth while to quote the monthly mortality figures for the past four years—1924 an entirely normal and healthy year—1925, the healthiest year on record, though marred by an unusual mortality in the last quarter—1926 and 1927 unhealthy throughout but especially so during the first and second quarters.

			1924	1925	1926	1927
			—	—	—	—
January	...	...	2,165	2,054	2,579	2,734
February	...	...	2,000	1,857	2,141	2,536
March	...	...	2,020	1,991	2,458	2,792
April	...	...	2,063	2,099	2,762	2,891
May	...	...	2,318	2,457	3,340	3,164
June	...	...	2,267	2,245	3,227	3,121
July	...	...	2,408	2,208	3,038	3,301
August	...	...	2,376	2,298	2,740	3,167
September	...	...	2,269	2,332	2,504	2,975
October	...	...	2,189	2,514	2,588	3,213
November	...	...	2,113	2,463	2,534	2,907
December	...	...	2,170	2,588	2,722	2,760
Estimated population	...	960,952	994,266	1,025,835	1,059,968	
Total deaths	...	26,358	27,106	32,633	35,561	
Death-rate per thousand	...	27.42	27.26	31.81	33.55	

The rainfall figures have an important bearing on the rise in the death-rate.

In Singapore the rainfall remained below the average, 2,576.43 as against 2,172 millimetres in 1926.

In the first half-year there were only 1,422 millimetres as against 803 millimetres. In Penang the rainfall for the first half was 1,232 millimetres, as against 607 millimetres, but the total for the year was 2,276 millimetres which is below normal. In Malacca the rainfall for the first half was 1,171 millimetres while the total for the year was 2,633 millimetres as against 2,409 in 1925. In consequence the deaths from Malaria though less than last year are still much above the average for the past few years. The flushing, which has been derived from the rainfall, to the anopheline breeding grounds is still not sufficient. It proved increasingly difficult to cope with the continued increase of *Anopheles Ludlow*, the dangerous brackish water breeder, in all the tidal swamps during the dry months.

The overcrowding in the Chinese quarter of Singapore was the cause of the increase in deaths from Tuberculosis and Pneumonias. Deaths from bowel diseases also increased due to the dry weather. The infantile death-rate also shows an increase.

GENERAL DISEASES

1. *Beri-beri*.—The deaths registered as due to Beri-beri in the last 17 years are:—

<i>Year</i>	<i>Number of deaths</i>	<i>Year</i>	<i>Number of deaths</i>
—	—	—	—
1911 (Census 714,069)	2,056	1920	1,025
1912	1,926	1921 (Census 881,939)	1,299
1913	1,657	1922	1,388
1914	1,483	1923	904
1915	1,079	1924	910
1916	1,075	1925	973
1917	2,075	1926	1,098
1918	1,958	1927	1,528
1919	1,430		

The estimated population for the year 1927 was 1,059,968. Food rationing leading to a decrease in the use of overmilled rice was in practice from 1918 to 1921. Indulgence in the more expensive overmilled types of rice, arising probably from increased prosperity, may be the cause of the rise in the death-rate.

2. *The Pneumonias*.—Deaths under this head numbered 3,353 as against 2,807 in 1926 and 2,214 in 1925. Of these roughly one-third (1,172) including a number of children were classed as Bronchopneumonia, and two-thirds (2,181) as pneumonia.

3. *Convulsions*.—No less than 5,784 deaths were so registered in 1927 as against 4,783 in 1926 and 3,890 in 1925.

INFECTIOUS DISEASES

(a) There were three deaths from Plague in the Singapore Municipal Limits which is the lowest death-rate during the last decade.

Four thousand one hundred and thirty-seven rats were examined during the year by the Municipal Bacteriologist, Singapore, but none were found to be infected.

(b) There were 30 cases of Cholera and 16 deaths, excluding cases occurring in quarantine stations amongst passengers who had not landed.

(c) *Small-pox*.—There were 117 cases of small-pox with 26 deaths. Of these Malacca accounted for 98 cases with 19 deaths.

Vaccinations.—Ninety six thousand one hundred and seventy-two vaccinations and re-vaccinations were performed, as follows:—

Perfect	...	...	...	42,336
Modified	...	...	...	4,408
Failed	...	...	...	886
Not seen	...	...	...	48,542
Total				96,172

(d) Cerebro-spinal Meningitis accounted for 19 cases with 12 deaths.

OTHER INFECTIOUS DISEASES

(1) *Tuberculosis*.—Deaths registered numbered 2,903 as against 2,526 in 1926 and 2,604 in 1925. Of these 1,523 deaths occurred within Municipal Limits of Singapore, and 422 deaths occurred in Penang. Tuberculosis is largely spread by overcrowding.

(2) *Malaria*.—In considering the deaths from Malaria, those registered as due to “fever unspecified”, the majority of which are probably due to malaria, must be taken into account. Figures for the quinquennium are:—

<i>Year</i>			<i>Malaria</i>	<i>Fever Unspecified</i>	<i>Total</i>
—			—	—	—
1923	...	...	3,430	2,946	6,376
1924	...	...	3,462	2,706	6,168
1925	...	...	4,235	2,043	6,278
1926	...	...	6,452	2,398	8,850
1927	...	...	6,283	2,161	8,444

In Singapore Municipal area the Malaria deaths contributed 1,287 as against 1,600 in 1926, whilst the numbers registered as due to Fever Unspecified were 376 as against 345 in 1926.

In Penang Island the deaths from Malaria dropped from 881 in 1926 to 832.

Deaths from Malaria in the rural settlement of Malacca contributed 2,197 deaths as against 1,728 in 1926.

The rural area in Province Wellesley recorded 1,464 deaths from Malaria as against 1,783 in the previous year.

(3) Dysenteries were responsible for 1,096 deaths against 1,015 and 857 in the two previous years. The classification was:—

Dysentery Amœbic	...	...	...	344
Dysentery Bacillary	...	...	...	282
Dysentery Unclassified	..	...	...	470
Total				1,096

(4) Diarrhœa and Enteritis caused 1,409 deaths as against 1,169 and 1,043 in the last two years.

VENEREAL DISEASES

The recommendations of the Advisory Committee on Social Hygiene have been closely followed in the programme of propaganda carried out, with a view to the education of the public on the subject of venereal disease. The various philanthropic bodies have shown a keen desire to help in the dissemination of information and have rendered valuable assistance.

Pamphlets and leaflets were published by the Social Hygiene Office, Singapore, and about 90,000 copies have been distributed in English, Chinese, Malay and Tamil.

Posters on the subject of Venereal Disease and advertising the Clinics were posted daily throughout the streets of Singapore.

Cinema films.—Two films were exhibited—one ‘Youth and Life’ and the other ‘Social Hygiene for men’. They were shown to 15,000 people in all, on 18 occasions.

A Chinese lady visitor was engaged to carry out propaganda amongst women. She has given informal lectures, and has distributed specially prepared leaflets to Chinese women.

In its propaganda activities the Social Hygiene Board has received valuable assistance in the form of propaganda material and information from the various Social Hygiene Councils in England, France, United States of America, Berlin, Dresden and Shanghai.

LEPROSY

(a) The number admitted to institutions increased by 41 as against 74 in 1926.

		Remained	Admitted	Died	Absconded	Discharged	Remained
Men	{ Pulau Jerejak ...	707	164	122	17	—	732
	{ Singapore ...	37	86	9	7	3	29
Women	{ Penang ...	38	13	7	1	1	42
	{ Singapore ...	51	15	6	—	5	55
Total ...		833	278	144	25	9	858

Deaths in 1926 were 140. From Singapore 75 men were transferred to Pulau Jerejak.

(b) Extensive structural alterations were carried out at the old settlement. Brick incinerators were erected and these have helped to improve the sanitary state of the settlement greatly. Mr. LANGHAM CARTER, late Resident Councillor, Malacca, now of Norfolk, England, generously sent a gift of \$50 which was utilized for the purchase of gramophone records for the inmates.

(c) *Treatment*.—Nearly all the lepers are voluntarily under treatment and the death-rate is still decreasing.

	1922	1923	1924	1925	1926	1927
Cases ...	868	888	891	996	1,070	1,111
Deaths ...	207	164	150	143	140	144

The pure expressed oil of Hydnocarpus has given the best results.

Reports by Dr. J. C. CARSON, Singapore, and Dr. A. H. WHEATLEY, Deputy Medical Officer, Pulau Jerejak Leper Settlement, are attached as Appendices A and B.

HELMINTHIC DISEASES

Ankylostomiasis.—The total number of Ankylostomiasis cases treated and of deaths therefrom in the hospitals of the Colony for the past five years is as follows:—

Year	Remained	Admitted	Total treated	Deaths
1923 ...	109	2,399	2,508	124
1924 ...	87	1,800	1,887	120
1925 ...	195	4,304	4,499	123
1926 ...	138	3,996	4,134	142
1927 ...	138	3,874	4,012	102

The annual report on the Hookworm and Sanitation Campaign was written by Dr. PAUL RUSSELL and most of it is to be found in Appendix E.

IMPROVEMENT OF PUBLIC HEALTH

To show the improvement in public health during the past generation, I attach two graphs and three diagrams numbered I, II, III, IV and V.

I is a graph depicting the mean monthly death-rates in Singapore from all causes in the decennial periods 1903-1912, and 1913-1922 and in the 5 years 1923 to 1927. Material is not available to make such a graph for the whole Colony.

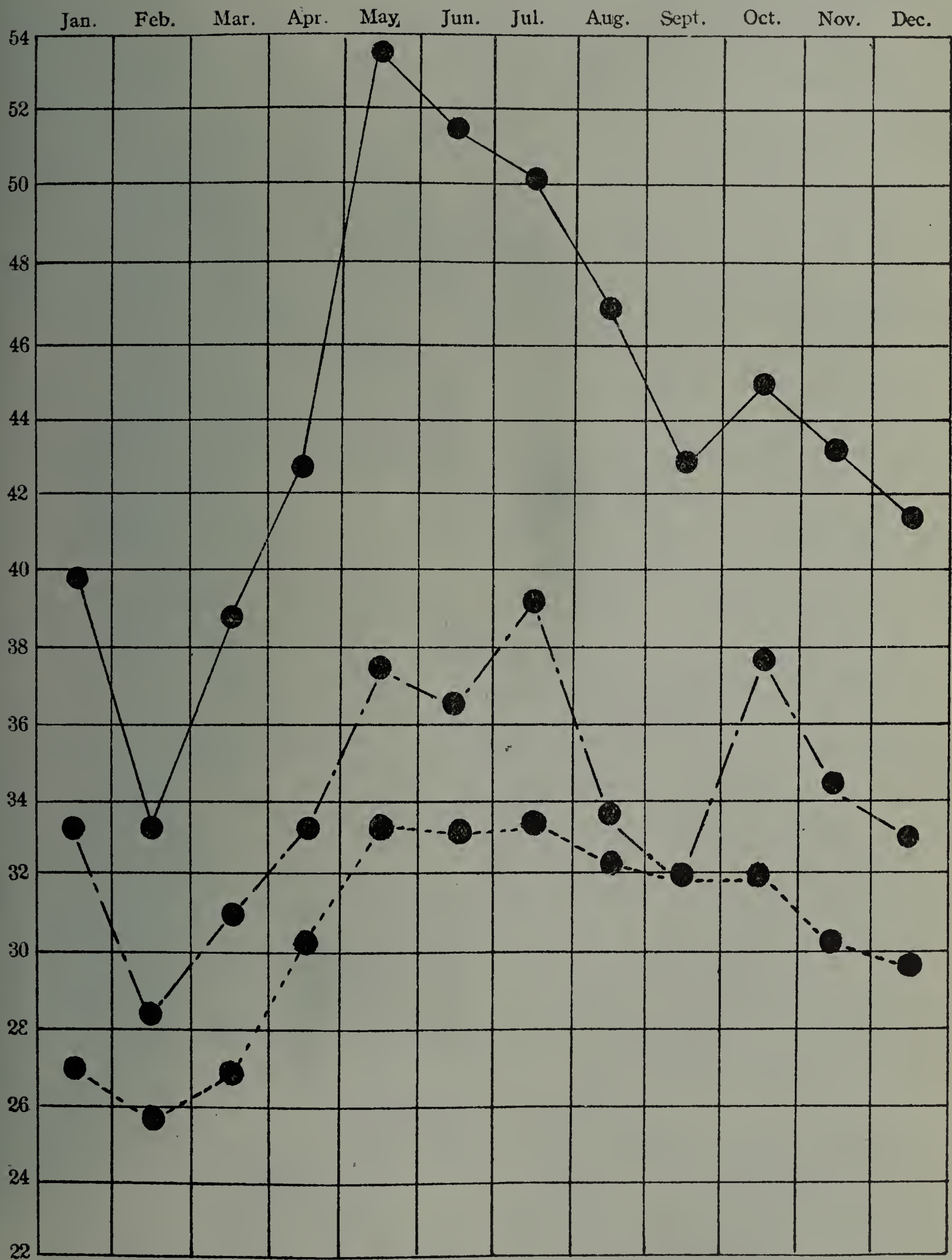
II is a graph giving a monthly comparison between two peculiarly unhealthy and malarious years, 1911 and 1927. I attribute the improvement in the latter year more to anti-malarial measures than to any other cause. The infantile mortality has dropped 50 per cent since 1911.

III is a diagram showing the total deaths from preventable diseases and the total deaths from all causes during the year 1927.

IV is a diagram showing the total number of cases of infective and preventable diseases admitted to our Government hospitals in 1927 and the deaths therefrom.

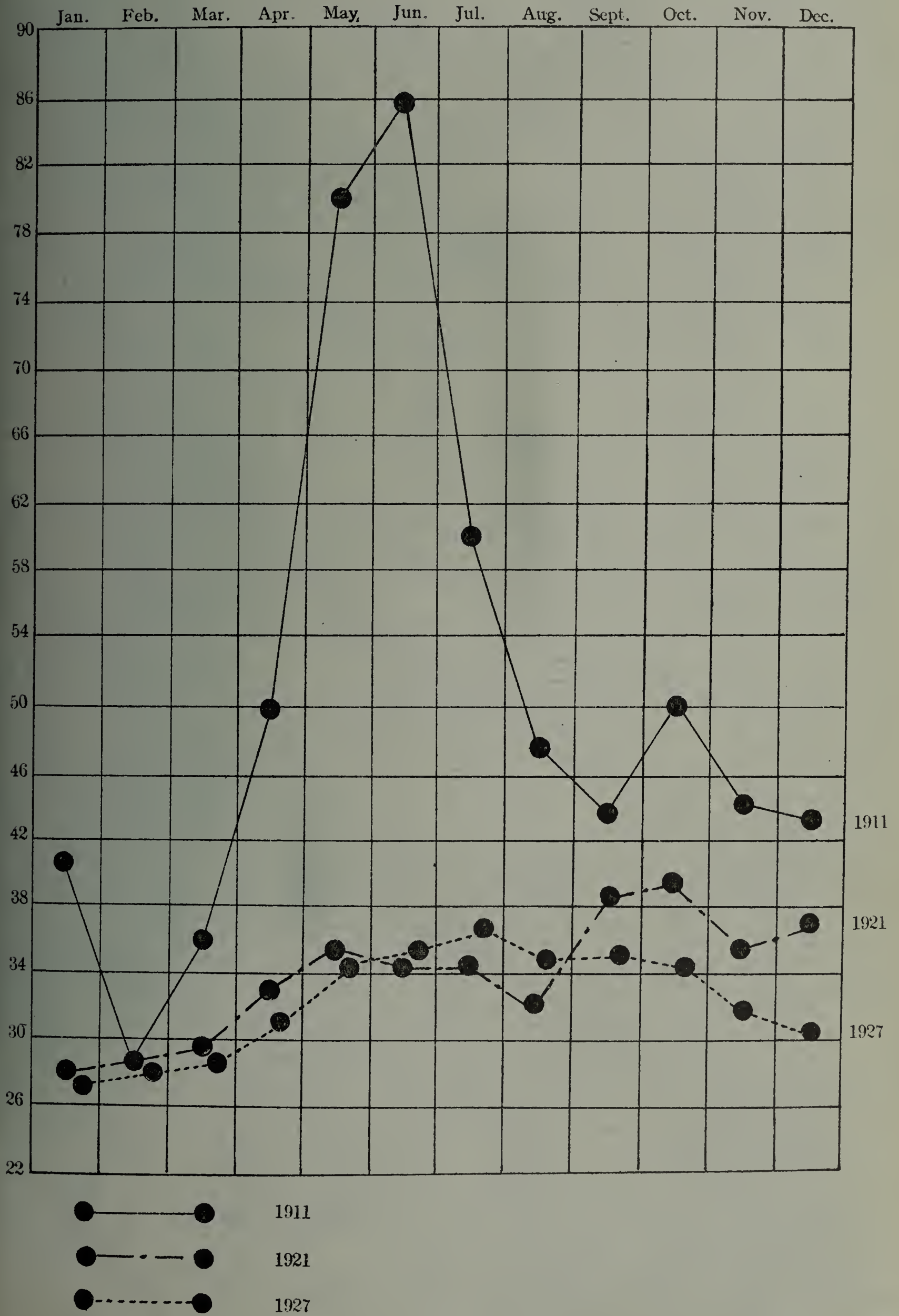
V is a diagram showing the total cases of diseases admitted to the Government hospitals in 1927, and the deaths therefrom, differentiating between preventable and non-preventable diseases.

(Singapore)
Monthly Death-Rate from all causes.

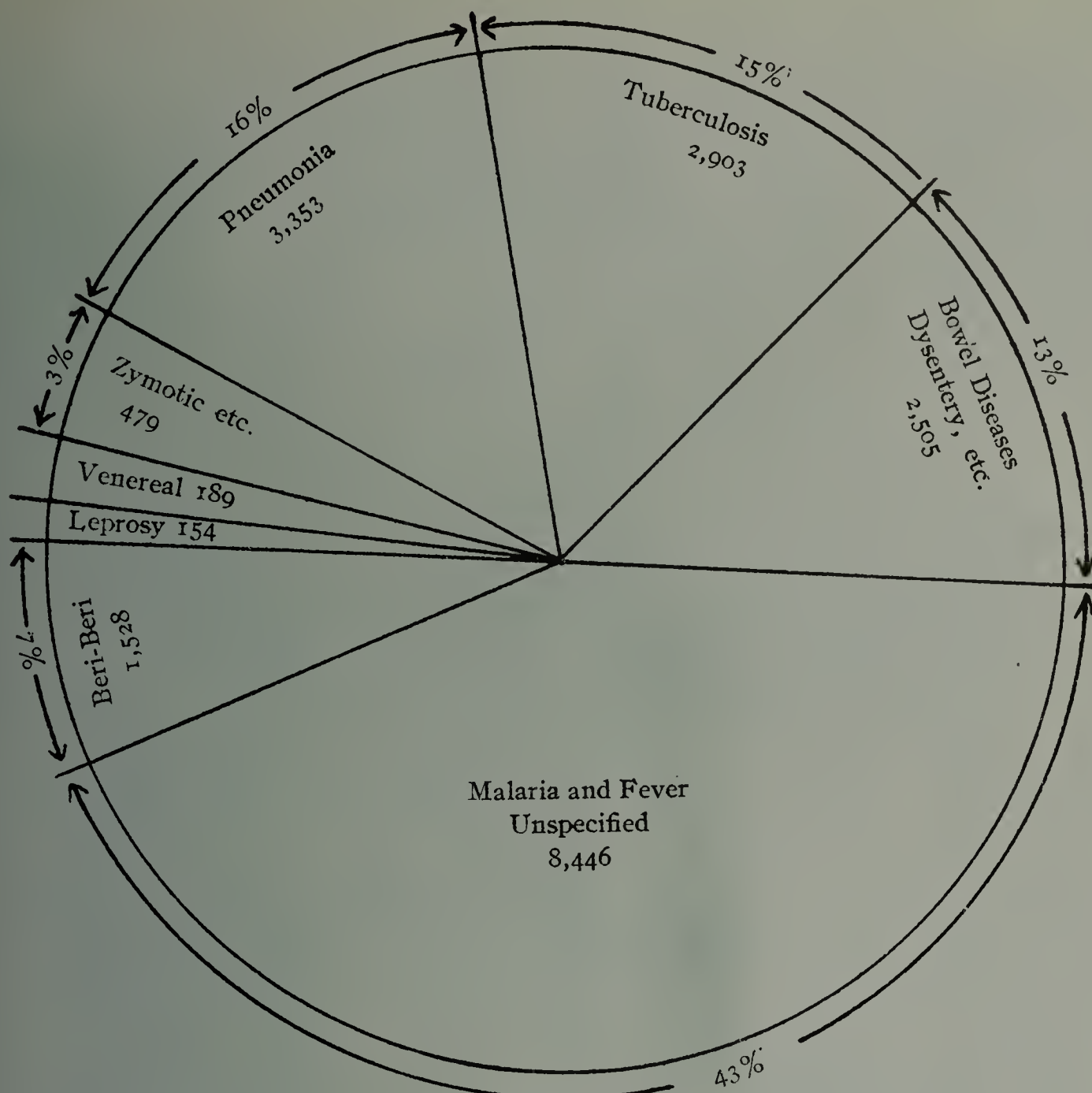


● — ● 1903—1912
● — — ● 1913—1922
● - - - ● 1923—1927

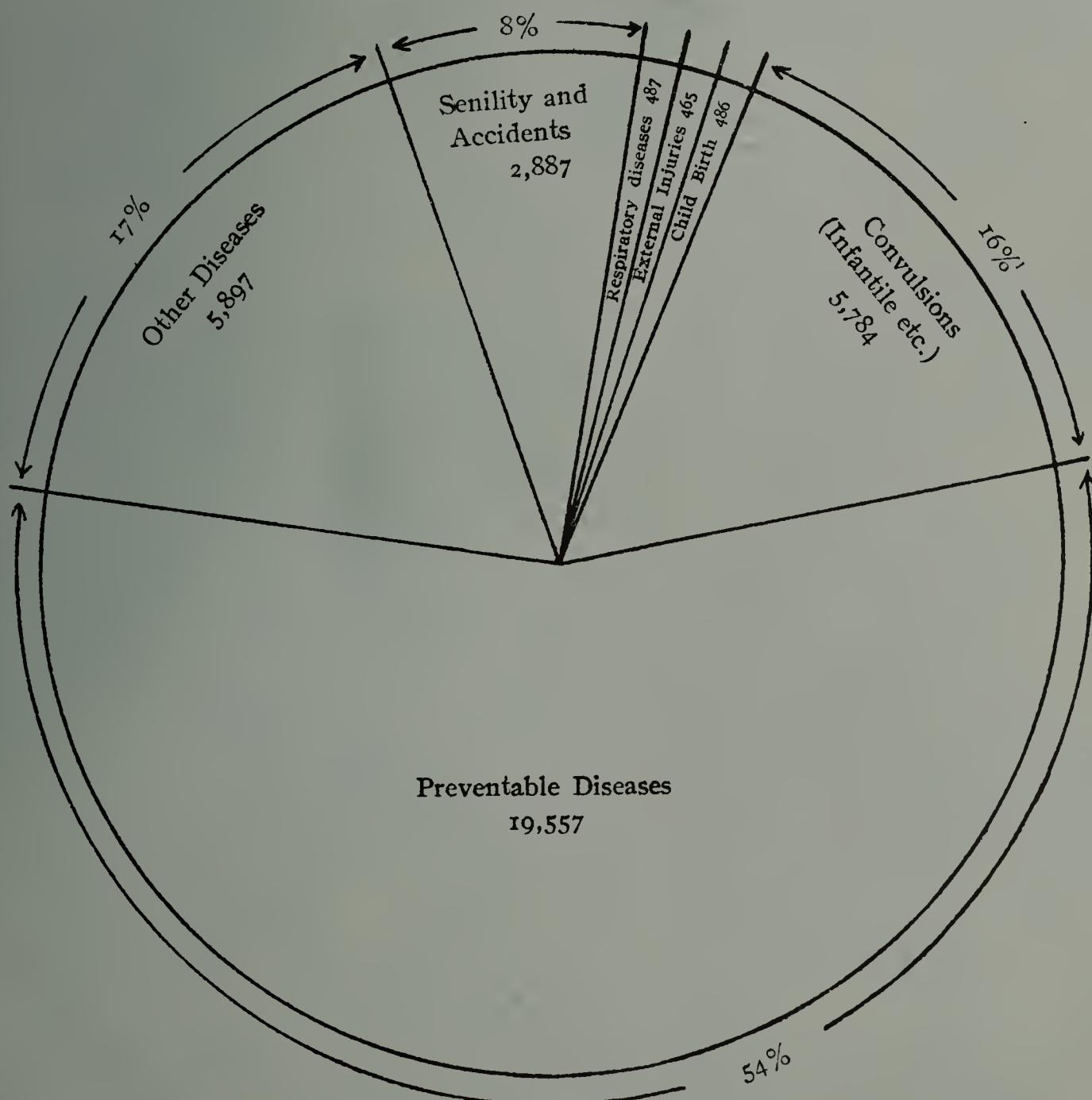
(Singapore)
Mean Monthly Death-rate from all causes



Deaths from Infective and Preventable Diseases
registered in the S.S. in 1927.

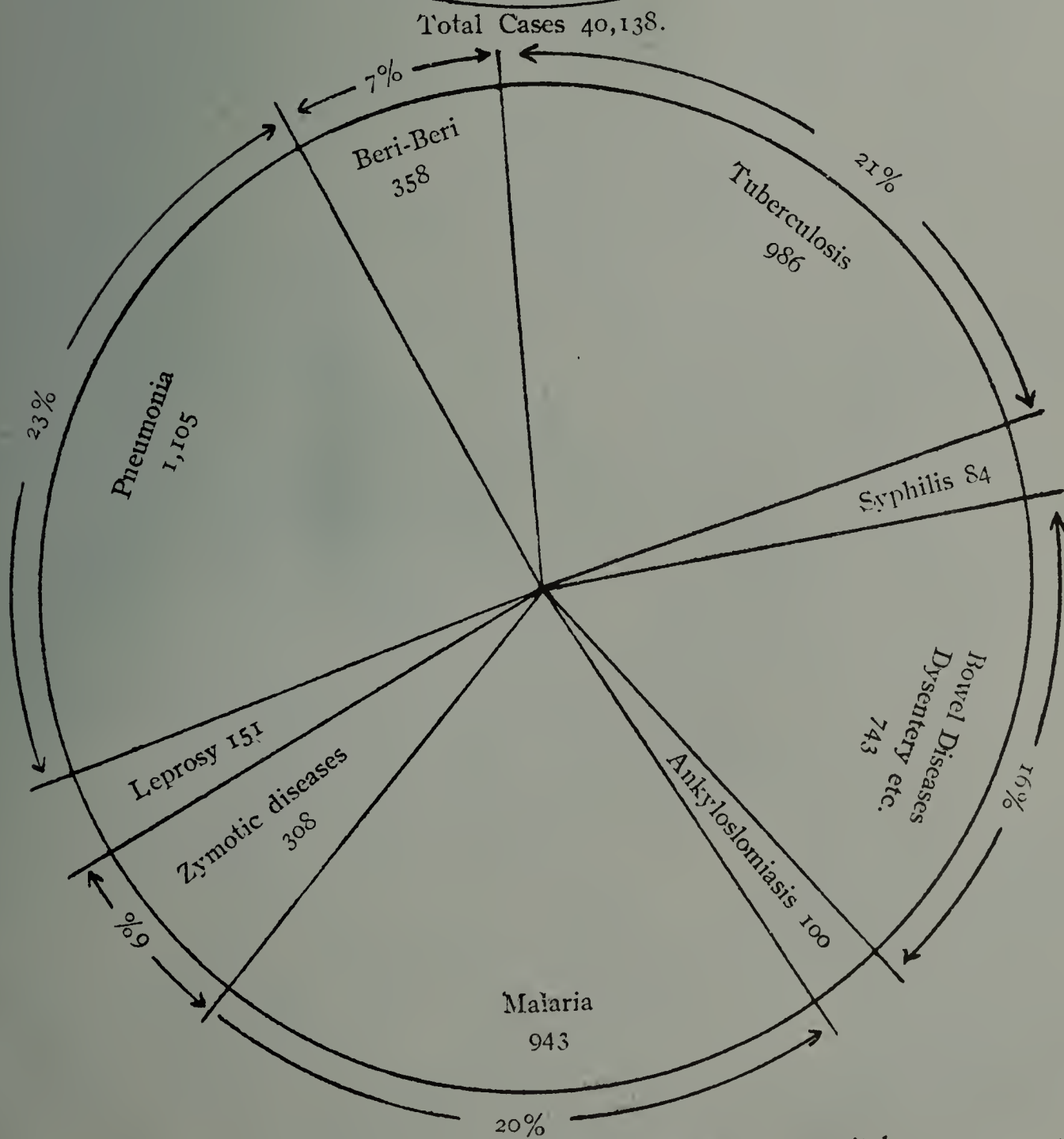
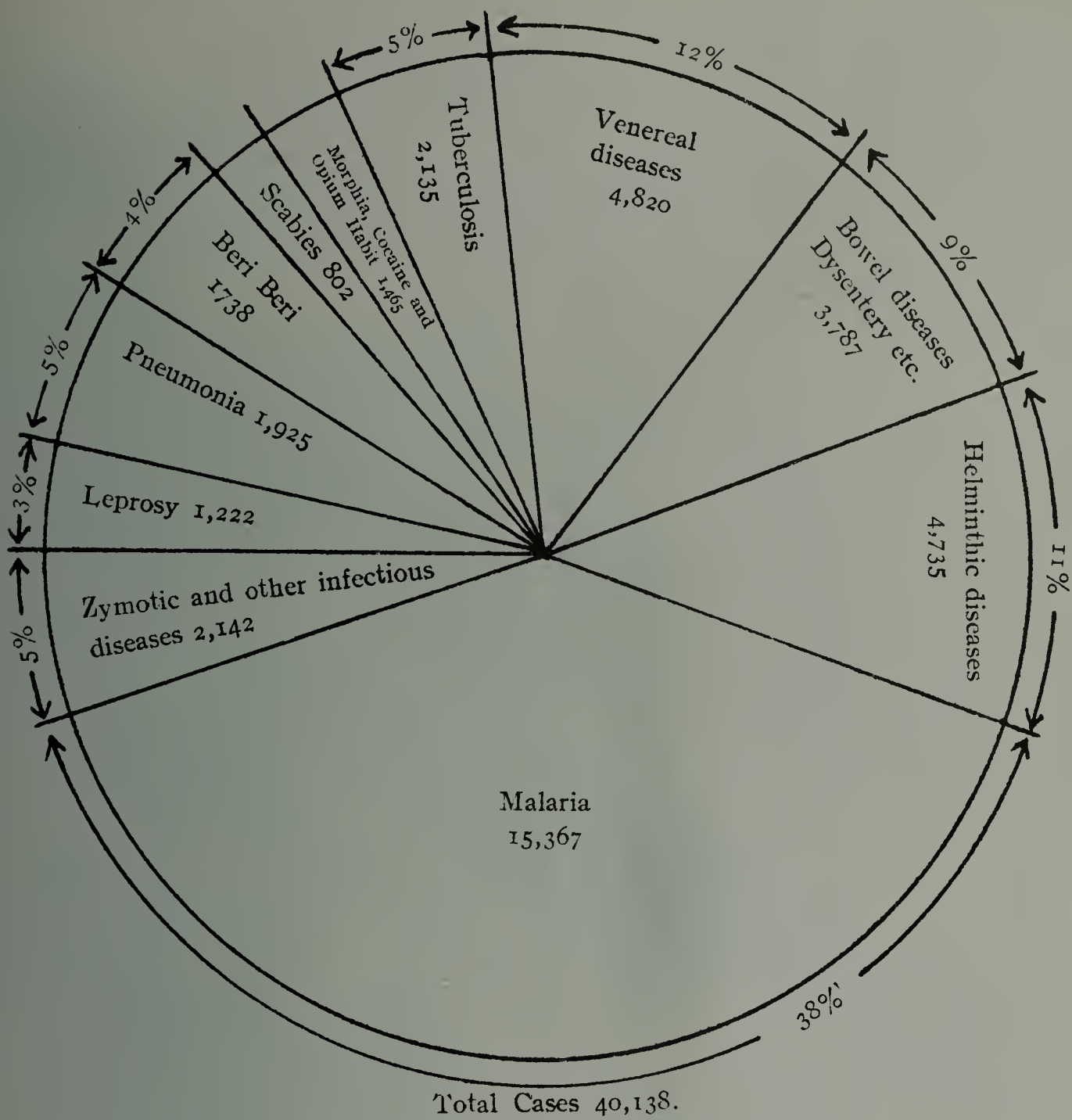


Total Deaths 19,557 (Preventable)

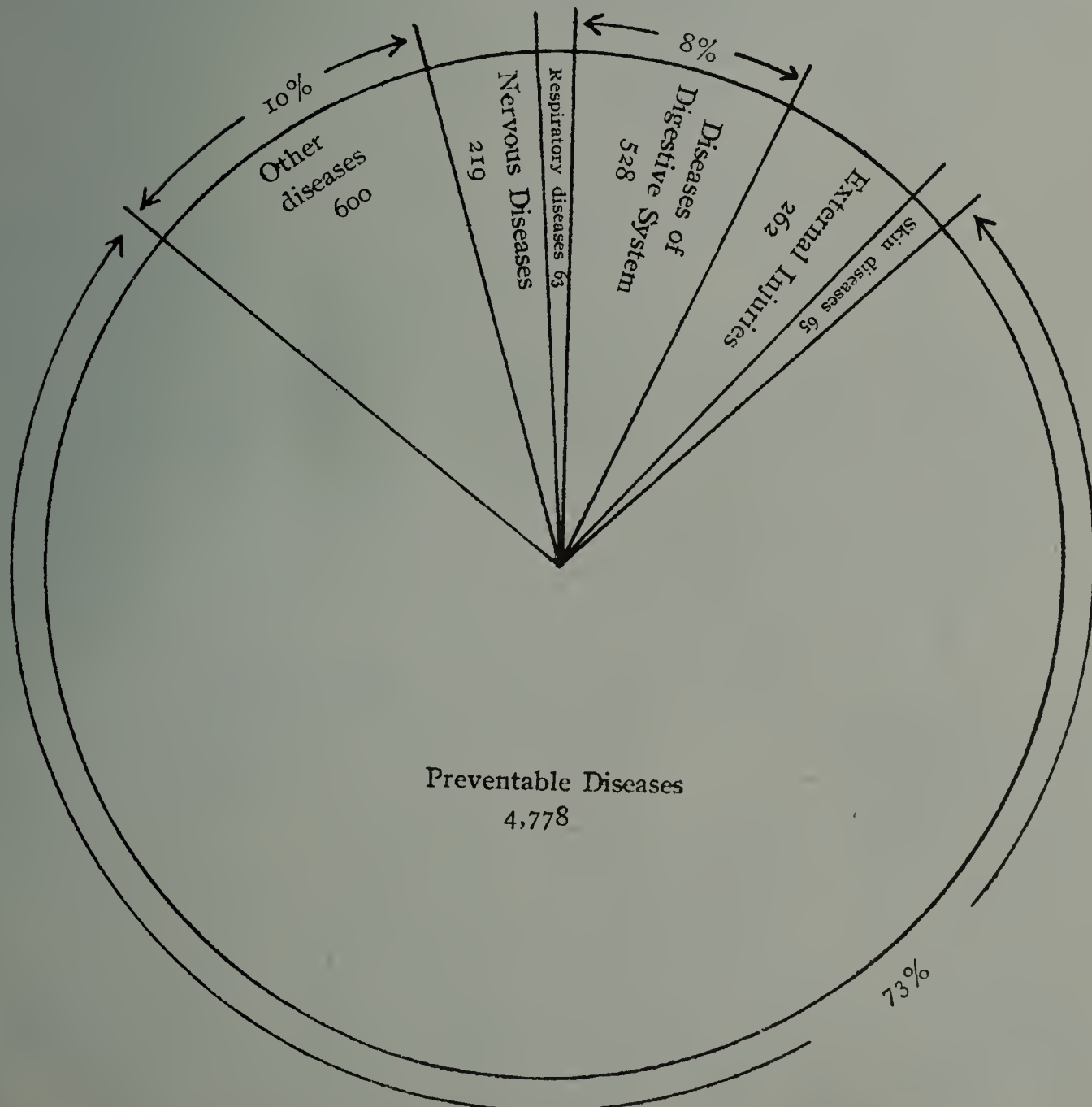
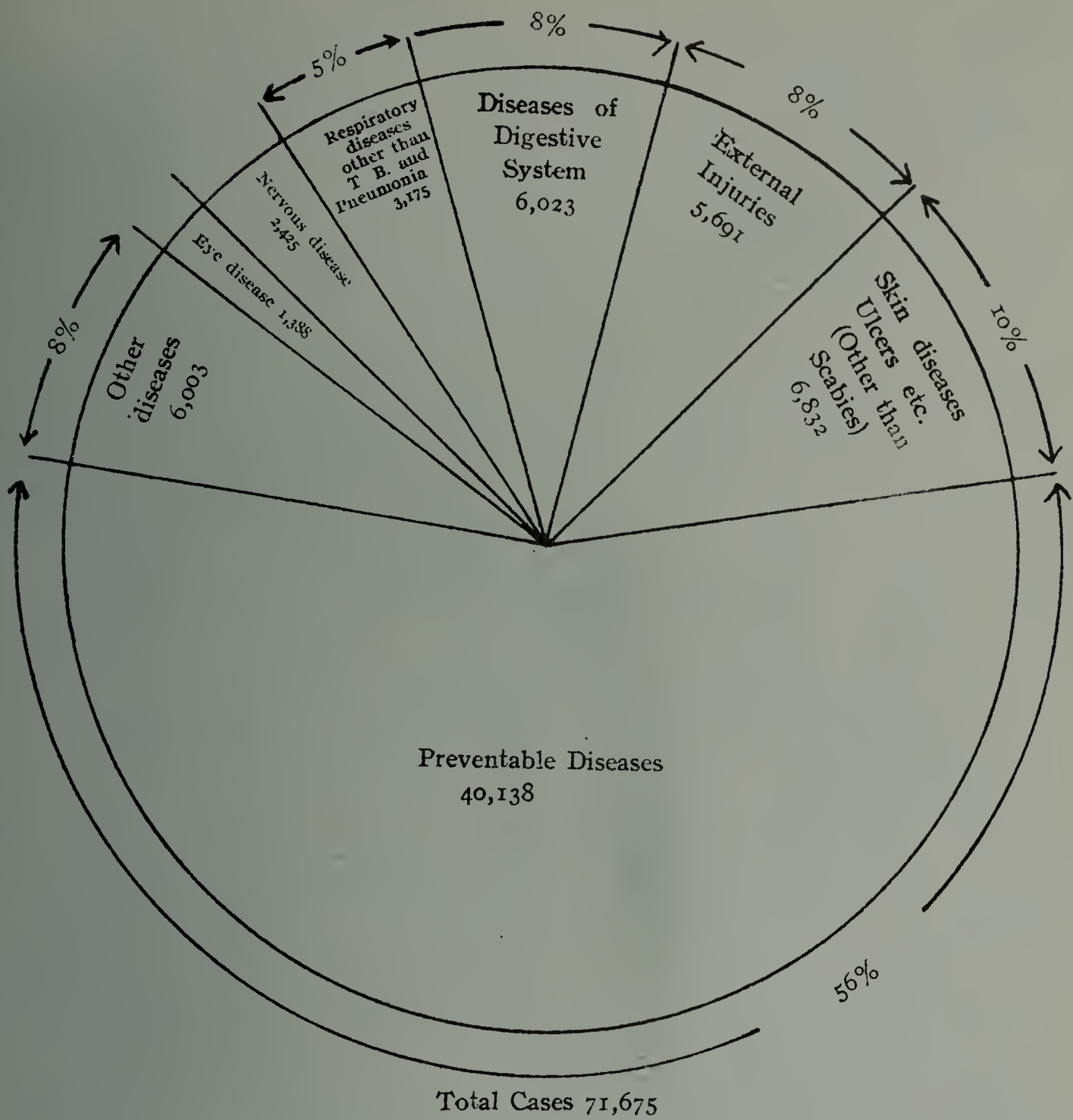


Total Deaths from all causes 35,563

Infective and Preventable Diseases
admitted to the S.S. Hospitals during 1927.



General Systemic and Preventable Diseases
admitted to the S.S. Hospitals during 1927.



VITAL STATISTICS

Under heading Table III, the following ten Tables are appended:—

Table III A.—Estimated population with birth and death-rates for the years 1926 and 1927.

Table III B.—Quarterly death-rates for various parts of the Colony during the past three years.

Table III C.—Population estimated racially and collectively of the Straits Settlements for the years 1927, 1926 and 1925.

Table III D.—Births registered in the Straits Settlements during 1927 and their ratio per mille of population.

Table III E.—Births registered in the Straits Settlements during 1927 according to Nationalities.

Table III F.—Deaths registered in the Straits Settlements in 1927 according to Nationalities.

Table III G.—Deaths registered in the Straits Settlements in 1927 under different groups of ages.

Table III H.—Table showing the Infantile Mortality (under one year) in the Straits Settlements and Nationalities, including children born elsewhere.

Table III I.—Table showing the Infantile Mortality (under one year) in the Straits Settlements and Nationalities, excluding children born elsewhere.

Table III J.—Deaths registered in the Straits Settlements as regards certificates in the year 1927.

2. The number of births registered throughout the Straits Settlements during the year 1927 was 37,233 (males 19,239 and females 17,994) as against 33,694 (males 17,482 and females 16,212) in the previous year: this represents a crude birth-rate of 35.13 per thousand persons living as against 32.85 in 1926 and 31.98 in 1925.

3. In every 100 births registered, there were 51.67 males and 48.33 females, giving a percentage of 93.53 females to every 100 males born.

4. One thousand seven hundred and eighty-five still births were registered in 1927 as compared with one thousand five hundred and sixteen still births in 1926—the percentage to those born alive was 4.79 as against 4.50 in 1926 and 4.26 in 1925.

5. The highest birth-rate according to Nationalities was 43.03 per thousand of population amongst Malays, the Chinese coming next with a ratio of 35.27 per thousand of population *vide* Table III E.

6. The deaths from all causes in 1927 were 35,561 (males 23,072 and females 12,489). The crude death-rate, 33.55 per thousand as against 31.81 in 1926, was the highest since 1918. Death-rates for the last seventeen years are:—

<i>Year</i>			<i>Ratio per mille</i>	
—			—	
1911 (Census)	...	...	46.46	
1912	...	...	39.01	
1913	...	...	34.93	
1914	...	...	34.13	
1915	...	...	29.15	Repatriation of several thousands of decrepit Chinese
1916	...	...	30.70	
1917	...	...	36.98	
1918	...	...	43.85	Influenza Epidemic
1919	...	...	33.04	
1920	...	...	33.20	
1921 (Census)	...	...	31.54	
1922	...	...	30.68	
1923	...	...	27.80	
1924	...	...	27.42	
1925	...	...	27.26	Lowest recorded death-rate
1926	...	...	31.81	
1927	...	...	33.55	

7. The highest racial death-rate was classed under Malays with a ratio of 36.68 per thousand of population, the Chinese coming next with a ratio of 33.34 per thousand of population.

8. It is always difficult to assess the true infantile mortality. The Municipal Health Officer, Singapore, gives the uncorrected infantile mortality for the City as 227. He states, however, that 7,172 infants were landed here from China. 3,526 were recorded as having left for other ports leaving 3,646 who presumably were added to our infant population. If these are added to the total births the infantile mortality in the Singapore Municipality rate falls to 180.9 per 1,000. The infantile mortality does not take into account the infants arriving from abroad, except that a special note is made of the death of any infant resident less than three months in the Colony.

9. Table showing the sick, invaliding and deaths of European Officials of all ranks:—

	1925	1926	1927
	—	—	—
(1) Total number of Officials on the Establishment	671	672	689
(2) Average number resident in Colony	673	547	617
(3) Total number on sick list	325	259	246
(4) Total number of days on sick list	3,726	3,728	3,125
(5) Total number invalided	10	7	9
(6) Total deaths	2	5	3
(7) Total deaths in the Colony	2	5	3
(8) Average daily number on sick list ... ..	.89	.58	.57
(9) Average number of days on sick list	10.2	10.21	12.7
(10) Percentage of deaths to number resident ... ..	.35	.91	.48
(11) Percentage of sick to the average number resident during the year	—	47.35	39.87

10. Table showing the sick, invaliding, and deaths of Non-European Officials:—

	1925	1926	1927
	—	—	—
(1) Total number on the Establishment	—	5,815	5,994
(2) Average number resident	—	5,577	5,252
(3) Total number on sick list	—	2,928	2,948
(4) Total number of days on sick list	—	23,966	38,708
(5) Total number invalided	—	45	54
(6) Total deaths	—	42	24
(7) Average daily number on sick list	—	244	.57
(8) Average number of days on sick list	—	8.18	6.5
(9) Percentage of deaths to number resident	—	.73	.45
(10) Percentage of sick to number resident	—	52.50	56.11

III.—HYGIENE AND SANITATION

There is no Chief Health Officer for the Straits Settlements. I am, therefore, including in this section under the signature of the officers concerned, reports from the Acting Chief Health Officer, Singapore, Acting Senior Health Officer, Penang, and Health Officer, Malacca. Extracts from a report on the second year of our joint rural Sanitation Campaign by the Resident Health Officer of the International Health Division of the Rockefeller Foundation is attached as Appendix E.

The Port Health Administration is under the control of the Government Health Officers mentioned, and is therefore included in this section. The report on School Hygiene follows the reports of these officers.

As regards preventive measures against mosquito-borne diseases, a large amount of permanent anti-malarial drainage was again carried out in Singapore and Penang Islands, Province Wellesley, the Dindings and Malacca, and a beginning was made in Labuan.

With the exception of a small amount of water-borne sewage in Singapore, the collection of the whole of the night-soil in the Straits Settlements is by hand. In some parts it is then dumped out at sea, in others it is incinerated or buried, and yet again it is often used as fertiliser.

Scavenging is performed in cities by the Municipal Authorities and in the country by Rural Boards. In both cases the refuse is incinerated.

The pipe water supplies are excellent in Singapore and Penang and are being greatly extended to meet the needs of the growing population. The extension in the case of Singapore is coming from the mainland of Johore. A good piped supply is now being introduced into Malacca town. In rural areas, some of the small towns and villages have piped supplies while many small villages, kampongs and isolated houses still depend upon shallow wells.

Offensive trades operate almost entirely in the municipalities where they are effectively controlled.

As regards labour in the rural areas, organised labour is engaged mostly on rubber estates and on public works. The larger estates employ medical officers, and have small hospitals or sick lines, from which serious cases are frequently transferred to Government hospitals.

The scheme under which the Malacca Agricultural Medical Board (Board of Planters) has grouped and assessed the whole of the estates in Malacca, engaged six medical officers and stationed them at convenient centres, and divided the medical charge of estates amongst them, has proved a success, and has helped to reduce the Malacca death-rate. Some of these medical officers have done good preventive work. The system under which each estate makes its own arrangement for medical attendance still prevails in Province Wellesley and Dindings. It sometimes results in superficial attention from visiting practitioners, who may live far from the area, and be too busy to do the work properly.

The health of the Public Works labour is directly cared for by the Medical Department.

Factories and shops in cities are under the control of the Municipal Health Officers.

The congestion in Singapore and Penang with the resultant over-crowding is an important factor in the heavy mortality from Tuberculosis, Pneumonia and Infantile diseases.

The inspection and control of food is carried out by the Municipal and Government Health Officers in their respective areas. There are markets at all centres

Milk vendors, eating houses, meat shops, and aerated water factories are licensed and inspected. Water, milk and other beverages, and foodstuffs both local and imported are regularly analysed, and action taken if indicated.

The only common deficiency disease is Beri-beri.

REPORT OF THE GOVERNMENT HEALTH DEPARTMENT, SINGAPORE.

By Dr. GILBERT E. BROOKE, L.R.C.P. AND S., D.P.H., *Chief Health Officer.*

I. STAFF.

1. The number of Health Officers in the Department was seven; the number of Inspectors, Vaccinators, Overseers, Mosquito Collectors, etc., was 17; Clerks and Interpreters seven.

The total Quarantine Station Staff was 106, and the average number of Rural Mandores [*i.e.* overseers], Masons and Coolies employed amounted to 226. It is a pleasure to report that the standard of responsibility, technical ability and departmental enthusiasm continued to be maintained at a satisfactory level. In looking back over the twenty-five years during which it has been my privilege to guide the destinies of the Health Department, I am conscious that the aggregate attitude of the individual members of the staff towards the problem of work *per se*, will be no less a dominant factor in the pathway of progress and achievement than will be the guiding hands and brains of those set in authority.

2. The first attempt at controlling maritime health problems would appear to have been the direct outcome of a Singapore Cholera Epidemic (857 cases) in 1873, which had been introduced from Bangkok by s.s. *Chow Phya*. The Acting Master Attendant—HENRY ELLIS—who had formerly served in the Indian Navy, and had then only recently been transferred from Penang to Singapore, wrote to Government in the same year suggesting:—

- (a) a steam cutter for Quarantine boarding;
- (b) a floating Police Station;
- (c) a hospital on St. John's Island;
- (d) a Quarantine burial ground on Peak Island.

These suggestions bore fruit, and a 'lazaretto', of a sort, was completed in 1874 which was just in time to deal with a heavy Cholera infection brought by s.s. *Milton*.

St. John's Island has remained the Quarantine Station ever since, but no boarding of ships was done for 10 years, until the services of an Apothecary were sanctioned in 1883. The substantive appointment was not however filled until 1895, and the Principal Civil Medical Officer—Dr. ROWELL—did both town and port health work himself for the 10 years. In those early days, cholera cases were treated in the wards of the General or Pauper Hospitals. Later, cases from ships were removed to St. John's Island, and shore cases to a Government Infectious Diseases Camp in Balestier Road, which was in use for many years until the Municipality opened their own Infectious Diseases Hospital (the Middleton Hospital) in Moulmein Road, in July, 1913. It may be mentioned that the standard treatment for cholera in the "fifties" was a stock mixture consisting of—tincture of calumba six ounces; compound tincture of cardomons two ounces; aromatic spirits of ammonia two ounces; compound tincture of camphor three ounces; and tincture of capsicum one ounce. The dose was two drams in peppermint water, and the patient was then "briskly shampooed". In the "seventies", reliance was usually placed on the exhibition of dilute sulphuric acid in half dram doses, and the inhalation for an hour or two at a time of the fumes from burning sulphur and nitre.

3. Coming to more recent times, the modern regime may be said to have started with the appointment of the first Port Health Officer—Dr. A. DAVIDSON (M.D., Aberdeen) who assumed duties in September, 1901. He resigned however, in about two months, finding the work uncongenial and trying to his health. The present writer was then appointed Port Health Officer by the Secretary of State, in December, 1901. By the terms of appointment the duties of the office were to take "entire administrative and executive charge

of the Health Department of the Port of Singapore"—the work consisting of administering the office, boarding ships, directing the Quarantine Station, and controlling infectious disease throughout the Island of Singapore (which is about equal in size and shape, to the Isle of Wight).

The magnitude of this work, with an annual immigration not far short of a quarter of a million, and a daily entry of 20 to 40 steamers, was at first somewhat disconcerting, since the staff with which the situation had to be faced consisted only of:—

The Port Health Officer,
One Assistant Surgeon,
One Chinese Inspector,
A Peon and a Punkah Puller,

and the only additional help in those days (1902) was the staff of the Quarantine Station at St. John's Island which then consisted of one dresser and five gardeners. A comparison of the respective staffs in 1902 and 1927 will therefore give some indication of progress made:—

<i>Division.</i>	<i>1902.</i>	<i>1927.</i>
Medical Officers	2	7
Office and Shipping Staff	1	25
Clerical Staff	—	7
Quarantine Station Staff	5	106
Rural Staff	1	240
Total	9	385

An Administrative Resume for 1927 will be found as Appendix I.

4. *Shipping.*—During the year 1927, vessels arrived from 349 ocean ports, having a total entering tonnage of 13,625,155. These figures place the port of Singapore high on the list of world ports; and, at the same time, they emphasise the importance of Quarantine measures in a port which must be so liable to imported infection itself, and which must be so great a source of danger to the hundreds of ports with which it is in constant communication.

The essence of safety in such a case will largely depend on the facilities for speeding epidemiological information, as well as on the reliability of quarantine procedure and practice. For a number of years, in the early nineteen-hundreds, I found the greatest difficulty in obtaining quick information with regard to the Health conditions of neighbouring Eastern ports.

The periods chosen by the various administrations were in some cases 10 days, in other cases half a month; and, occasionally, one calendar month. Even if a weekly period was *en règle*, there was no uniformity in the hebdomadal caesura, and weeks would often elapse between the receipt of returns. The difficulties were however gradually overcome, and it became possible to chart out returns of neighbouring ports, to the great advantage of the Straits Settlements procedure.

The Quarantine Ordinance of the Straits Settlements passed in 1915 was the first legal enactment to recognise this principle (vide Section II—"Epidemic State") and its adaptation to the imposition and withdrawal of quarantine restrictions has worked without a hitch ever since. The last rung of the ladder was gained when the League of Nations opened their Epidemiological Bureau in Singapore in March, 1925. The history of this Organisation is now well-known. By means of a special two-letter code and the use of wireless broadcasting, the prompt and uniform collection and dissemination of Epidemiological Statistics became an established fact throughout most of the Eastern Arena, and this branch of their work is probably the most valuable of all their varied activities—an incalculable boon to every maritime Health Officer.

5. The ports against which quarantine measures were declared, during 1927, were as follows:—

Abadan, Amoy, Basra, Bangkok, Batavia, Bombay, Bassein, Bandjermasin, Calcutta, Canton, Chinwantao Haiphong, Hongkong, Hoihow, Kuching, Karikal, Madras, Macao, Mohammerah, Negapatam, Pondicherry, Perak, Rangoon, Swatow, Samarinda, Saigon, Shanghai, S. Siam, Touraine, Tuticorin, Teluk Anson, Tanjong Balei and Tsingtao.

A partial idea of the effectiveness of quarantine measures can often be gained by a perusal of the incidence of infectious disease in the urban districts of a port. A table of such incidence in Singapore for the past 34 years will be found in Appendix 2. The plague figures, which occur there, are probably (with the exception of 1918) the representation of two epizootic perennial foci in the town, as a topographical chart discloses. The small-pox and cholera, on the other hand are largely a matter of primary import, at any rate with regard to the first few cases. It is satisfactory to note that both these diseases show a steady annual diminution, notwithstanding their frequent presence (and, often, gravity) in contiguous countries.

6. The number of ships which entered the port during 1927 was 8,982, of which 1,568 were from quarantined ports and were examined by the Health Staff; and, from the remainder, reports were received by courtesy of the Marine Department. The crews examined by the departmental staff numbered 127,173; and the passengers 515,893, of whom 359,262 were Chinese Immigrants and 45,189 were outgoing or returning pilgrims. A resume of the annual figures for 25 years will be found as Appendix 3 disclosing a total of 10,162,191, who have been examined by our staff since 1903.

Routine examinations of rats on ships were carried out, as the work of the staff permitted. None of them were found to be infected. The majority were of the species *Rattus diardi*.

7. Of the incoming ships, 26 were found to be infected, and were suitably dealt with by our disinfecting launches. Of the latter we have three in use in Singapore, which were used on 371 occasions. The three launches were all built in Singapore, and are all fitted with a type *B* Clayton machine, and all run under their own steam. They have moreover a doubey-pump, and a tank of liquid disinfectant, enabling the thorough disinfection of any surfaces, bilges, etc.

The first of these launches—the *Hygeia*—was built as long ago as 1904 at a cost of \$28,000, and she has done yeoman service. The next launch—the *Crow*—was completed in 1913 at a cost of \$30,000. The most recent one—the *Lucifer*—was a post-war one (1925) and the price (\$60,000) reflects the general increase of trade values.

A Statistical Precis of the Shipping Section of the Health Department will be found as Appendix 4.

8. *Quarantine Station*.—The early beginnings of this large station have already been touched on, earlier in this report. In the last 25 years, 874,266 passengers have been sent to St. John's Island from infected or suspected ships. Of this figure 20,169 were admitted in 1927—the maximum number in residence on any day being 2,774.

Admissions to hospital totalled 310 of whom 83 died in hospital or camps—the death-rate amongst the total treated being 14.19.

9. Of infectious diseases, 15 cases of cholera were admitted, 19 cases of small-pox, and no cases of plague.

Small-pox vaccinations to the number of 1,685 were done on the Station, and 2,522 anti-cholera vaccinations.

10. The price of firewood being still prohibitive, no distillation was carried out; but 2,727,200 gallons of Singapore water were pumped into the reservoir by Messrs. Hammer & Co.

The general cleaning up of the station, repairs, alterations, the construction of a sea wall, the laying of brick paths, fencing of camps, painting and general upkeep, have proceeded steadily throughout the year. A very large amount of this work has been done by our own staff without cost to the Government other than that of materials employed, by which means a considerable saving has been effected. I must congratulate the Health Officer in charge—Dr. NELSON COOPER—for his efficient organisation and control; and also the staff who have done good work under his supervision. To anyone who could remember the station as it was 25 years ago, its present condition must appear both gratifying and satisfactory.

A Statistical Precise of Quarantine Station work for the year, will be found as Appendix 5.

The Diet Contractor for the year was LEE KHENG SENG, who had held the contract for the previous 2 years. He gave satisfaction in his deliveries. The contract rate for Chinese diets (which form the chief item of supply) was 20 cents per head—a normal figure for recent years; and reasonable too, considering the diet supplied, which is as follows:—

Rice	...	...	1 $\frac{1}{3}$ lbs.
Lard	...	...	1 ounce.
Salt	...	...	8 drams.
Fresh vegetables	...	...	8 ounces.
Onions	...	...	2 „
Tea	...	...	4 drams.
Pork	...	...	$\frac{1}{3}$ lb. alternately with salt fish $\frac{1}{4}$ lb.
Firewood	...	...	3 lbs.

11. *Rural Work of Health Department.*—Although the Port Health Office since its inception has nominally controlled public health and sanitary matters in the Island of Singapore outside municipal limits—an area of 217 square miles practically identical with the Isle of Wight, in shape and size, it was not until the work of the port and quarantine station had been reduced to some administrative smoothness, that attention could be turned to the large subject of Sanitation and Anti-malarial Work in rural areas.

Dr. A. G. H. SMART, after a short period as Health Officer, St. John's Island, and Port Health Officer, Penang, was appointed as our first whole-time Rural Health Officer in June, 1914. He, however, left for the War the following April and the rural work perforce lapsed for a few years.

12. About 1920, the Chief Health Officer was made a member of the Rural Board, and Dr. J. W. SCHARFF was appointed Rural Health Officer. Since that time, progress has been continuous, and the results have, on the whole, been sufficiently gratifying. The first administrative step was to divide the Island of Singapore into five Sanitary districts, of which the chief village in each district was to form a headquarters for the direction of the Campaign.

The Divisions chosen were C (Pasir Panjang), D (Bukit Timah), E (Seletar), F (Paya Lebar), and G (Gaylang). Further sanitary control, as regards Government matters, necessitated the inclusion of three more divisions—A (Urban), B (Docks and Wharves), and H (Marine—comprising the harbour and smaller islands to the South).

13. *Sanitary Inspectors.*—We were at once faced with the necessity of supplying Inspectors for the newly created Divisions, and, as no skilled men were obtainable locally, it was obvious that we should have to train our men ourselves. By a fortunate co-incidence, a small Government Dispensary in a Central Situation in the town—Jalan Klapa—was about to be closed. This building was handed over to us, and was converted for our purpose, to

accommodate a private laboratory and office; a students' laboratory, a lecture room, a teaching museum, and a considerable amount of space for the housing of stores.

In order that the course should have a wider sphere of influence, the Royal Sanitary Institute of Great Britain was approached, and agreed to recognise the training of local candidates by a local Board of Teachers on a schedule submitted to them, and to issue a joint Diploma with the Government of the Straits Settlements after examination at the end of each annual 6 months' course, which was to begin in May each year.

The centre at Jalan Klapa has proved extremely valuable during the seven years of its existence. The first course opened on May 1st, 1921, with a formal inauguration by His Excellency Sir LAURENCE GUILLEMARD on July 14th in the presence of a number of interested well-wishers. This course was attended by five selected candidates for Government Service. Of these, three were successful at the examination in November and obtained the Diploma of the Royal Sanitary Institute. Thereafter the course was thrown open to the public on payment of \$135 fee but with priority for those already in Government Service and to those born in the Straits Settlements or Federated Malay States. The following will give some idea of the progress of the institution:—

<i>Year</i>		<i>Lecture attendances</i>	<i>Examination attendances</i>	<i>Diploma awarded</i>
—		—	—	—
1921	...	5	5	3
1922	...	7	7	3
1923	..	8	9	3
1924	...	26	26	11
1925	...	43	36	12
1926	...	26	26	20
1927	...	20	33	21
		—	—	—
	Totals ...	135	142	73
		—	—	—

14. The work in rural areas consists mainly of two branches: village sanitation, and anti-malarial work. The former branch is carried on by one or two (or more) scavenging coolies, stationed in each village, under the direction of the Divisional Inspector; and village refuse is dealt with by brick incinerators, which are erected in each village. A useful Sanitary Inspection Sheet was devised for suspension in every house in all districts: A sample of this will be found as Appendix 7 to this report. The value of such a sheet is four fold: It ensures that each house is visited by an Inspector; it awakens an hygienic interest in the bosom of the house-holders; it enables the Health Officer (or newly appointed Inspector) to see at a glance when the last inspection was made, and what conditions were found, and it prevents the omission of any important items when the Sanitary Inspector is making his periodical inspection. An important branch of village sanitation is connected with the disposal of night-soil. In the Singapore Rural Districts, we have been gradually insisting on a sound but inexpensive type of the pail system principle. The soil is removed daily by a contractor and is then dealt with in one of two ways—It is either—

- (a) buried under supervision in an approved trenching ground; or
- (b) dumped into a septic tank, at a convenient distance from the village, the site being chosen with a view to utilisation of subsoil-drainage water for washing purposes.

15. With regard to Anti-malarial work, a beginning was made on a somewhat modest scale, and the programme has been extended year by year.

A preliminary mosquito survey was made of the whole rural area, and the results charted on the map. Another map was charted at the same time to show the rural domicile of all malaria patients admitted to the hospitals of the Settlement or treated in Dispensaries. The two maps, when placed side by side, disclosed an almost identical picture of the maculatus areas in the one case, and fever areas in the other. This useful piece of work had the two-fold result of—

- (a) demonstrating maculatus to be the only local carrier of any importance, and
- (b) reducing the necessary programme of action at a considerable economic saving.

A vote of \$100,000 was available, but for a year or two the full amount was not made use of, since it seemed advisable to effect the organisation somewhat gradually and feel one's way step by step rather than risk any wasted effort.

Experiments were also made with various mixtures of oils in order to demonstrate the most lethal and best spreading type which should at the same time be most inexpensive. The best result seemed at first to be obtained by the use of two parts of solar oil to one part of liquid fuel (crude oil). This mixture was used by the department until the middle of 1925 when a special A. P. C. mixture was adopted and used for the following two years. This mixture is, I understand, a mixture on much the same lines as mentioned above, but with the addition of a little low-grade kerosene.

The following table of anti-mosquito oil used by us, will give an indication of the gradual increase of activity:—

<i>Year</i>	<i>Solar Oil</i>	<i>Crude Oil</i>	<i>A. P. C. Mixture</i>	<i>Tar Oil</i>	<i>Total gallons</i>
—	—	—	—	—	—
1923	... 13,104	6,600	—	—	19,704
1924	... 14,377	7,588	—	—	21,965
1925	... 7,763	4,269	1,300	—	13,332
1926	... —	—	30,851	—	30,851
1927	... —	1,290	45,001	2,580	48,871

The mean cost of these oils are also a matter of considerable interest:—

Diesel Oil	...	...	... 34	cents per gallon.
A. P. C. Mixture	...	...	... 32 $\frac{1}{3}$	Do.
Solar Oil	...	...	... 31	Do.
Crude Oil	...	...	... 23	Do.
Tar Oil	...	...	... 21	Do.

With regard to the programme of agricultural drains, it is interesting to note that a total of 30.36 miles of agricultural pipes have been laid since 1922, giving an average of 6.07 miles per annum. The type of pipe that we used at first, was made of baked brick clay of local Chinese hand manufacture.

These were abandoned however owing to inferior workmanship and we next tried concrete pipes from Messrs. Kennison Bros. of Batu Caves. After a year or so of burial, considerable trouble was experienced, and, on exposing the pipes a large majority were found to be badly eroded—possibly due to the materials used in making the pipes, or to the re-action of the subsoil water, or to both causes combined.

Since then we have been using the machine-made pipes manufactured by the Borneo Co's. Brickworks at Alexandra Road, Singapore, and these have proved to be eminently satisfactory. Being machine-made, they are of uniform size—made of the best brick clay, and stoved in the kiln after drying, as in the case of bricks. The cost is 16 cents for 4" pipes; 22 cents for 6"; and 28 cents for 8".

One other point in this connexion might be mentioned. The agricultural drains are often apt to be clogged by sand, clay, roots, etc. An easy way to obviate this is to use half-section pipes (like inverted inverts) instead of whole pipes. The theory of this, is that the half-pipe keeps the channel from occlusion by the soil above it, while the water easily makes its own channel on the mud bottom of the trench and will generally overcome any obstacle. It is necessary, however that the half-pipes be "flanged" otherwise the weight of the soil may force the pipe into the ground and occlude the lumen. We have had several sections of this type which have worked well for some years, both at Bukit Timah and St. John's Island, and I think it has advantages if it could only be machine-made at low expense.

This concludes a brief review of our earlier rural effort, for which the two officers, already mentioned, were largely responsible. In addition, both Drs. J. I. BAEZA and P. C. FERNANDEZ have shown themselves to be keen and capable officers. To all of them I tender my thanks, and congratulate them on the work accomplished.

16. *Rural work during the year 1927.*—The most interesting report by Dr. SCHARFF will be found (with appendices) elsewhere in this report, and a Statistical Precipis of the Rural work as Appendix 8.

He quotes an interesting table at the outset—

<i>Year</i>	<i>Estimated population</i>	<i>Death-rate</i>	<i>Birth-rate</i>	<i>Infantile Mortality</i>
1921	... 68,003 (Census)	31·77	28·55	233·9
1922	... 70,432	28·17	29·01	209·5
1923	... 72,861	27·71	25·58	265·6
1924	... 75,290	25·99	35·07	214·6
1925	... 77,719	25·65	29·56	228·02
1926	... 80,148	32·50	34·43	224·4
1927	... 82,577	34·31	37·29	262·3

and he attributes the rising death-rate of the last two years to a combination of factors "amongst which the chief cause appears to be the continuation of the 1926 malaria wave".

The number of houses was 11,883 and 3,044 visits were paid by Sanitary Inspectors.

There are 22 incinerators in the rural areas, and 1,229,634 cubic feet of rubbish was consumed.

With regard to Infectious Disease, no plague was reported during the year, but there were 3 cases of Cholera and 12 of small-pox. Vaccinations, to the total of 8,053 were performed by the vaccinator Mr. OTHMAN, whose work has been conscientiously performed.

Dr. SCHARFF tabulates his results as follows:—

	<i>Total done</i>	<i>Percentage perfect</i>	<i>Percentage modified</i>	<i>Total not seen</i>
Primary vaccinations ...	2,238	89·4	2·8	161
Re-vaccinations ...	5,815	21·8	56·1	1,253
Totals ...	8,053	40·6	41·3	1,414

Nuisance notices were served in 1,124 cases, and 5 prosecutions were conducted.

With regard to the water supply, the reservoirs of Hammer & Co. were kept under observation, as also the many wells in rural areas: 61 samples of water being sent for analysis.

Mention has already been made of the conservancy effort and the establishment of a Trenching Ground at the 8th mile, West Coast Road, and a septic tank dump at Bukit Timah. Both these have proved a success. In addition to this 473 insanitary latrines were demolished, and 514 new latrines erected, as well as 80 demonstration latrines erected by the department. "It is estimated that now 70% of all dwellings are adequately conserved"—a satisfactory state of affairs.

17. The Anti-malarial work of 1927 has also been alluded to in this report. Five and a half (5.43) miles of subsoil pipes were laid during the year and 48,871 gallons of oil used for anti-mosquito spraying.

With regard to the oil-spraying, I noticed a useful-looking bye-product (tar oil) when visiting the gas works one day. This, on experiment, proved to have good lethal and spreading properties, and I consequently adopted its use as a mixture of two parts, to one part of liquid fuel. The cost of this excellent mixture is only 21½ cents a gallon as compared with 32½ cents for the A. P. C. mixture. At an expenditure of 50,000 gallons of oil per annum, this would mean a saving to Government of \$5,500 in the year. The new "rubber oil" may prove cheaper still.

The anti-mosquito vote was raised this year to \$120,000. Out of a sum such as this, it is interesting to note into what items the expenditure should be divided, and what proportion of charge should be allotted to each item of expenditure. The following may be taken of a reasonable allocation for such a vote:—

					\$
1. Staff	...	..	...	...	11,030
2. Oil	...	...	...	...	25,000
3. Labour for spraying and transport				...	11,525
4. Maintenance	...		...	...	9,000
5. New construction, material, etc.	...		...	...	63,145
					<hr/>
					\$120,000
					<hr/>

and it is more or less on these lines that we endeavour to frame our annual programme. As a matter of administration my attention was drawn to the extreme value of graphs (in connexion with spending departments) by perusal, when in Geneva earlier in the year, of a most useful book by KAIL K. KARSTEN, B.A. (Oxon:), entitled "Charts and Graphs"—published by ISAAC PITMAN in 1924. Following up some ideas therein, I devised a chart for departmental use, calling it a "Sumptuary Graph" and it proved its use at once.

18. Two other innovations might here be mentioned. Firstly, the inauguration of a Travelling Dispensary, and secondly the inception of a Child Welfare Campaign in Rural Areas.

The Dispensary, which is a chassis, with locally-built coach work, cost \$4,500 and started work in May, 1927. To it a dresser is attached, and the Services of an Assistant Surgeon have been supplied when available. The work carried out has been extremely valuable, and the record of attendances—*vide* the monthly figures given as Appendix 9—show that it has won the increasing confidence of the rural public.

The Child Welfare Campaign started in May; and, owing to delay in obtaining quarters at Malacca, we were fortunate in having the Services of the Malacca Sister, during the year, as well as our own. The two Sisters Miss I. M. SIMMONS and Miss A. MCNEILL have special qualifications and experience in Infant Welfare and Health teaching, and their interesting report on the work done in 1927 will be found as Appendix *P* of the general report. Their duties include visits to newly born children, supervision of the work of midwives, and general Kampong visitations to advise on health matters. Clinics were started at the Government Dispensaries at Joo Chiat Road (Monday and Saturday): Geylang and at Paya Lebar, Upper Serangoon Road (Wednesday and Saturday) and were held from 9 A.M. to 11 A.M.

The home visits were done as far as possible in co-operation with the Travelling Dispensary. Each day, one of the Sisters follows the Dispensary route, and also calls at all police stations en route to obtain the recent birth notifications. At many of these stations the police have been extremely kind in helping to locate the houses of the newly born children, and their assistance is gratefully acknowledged. Sincere thanks are also due to the Nestles Swiss Milk Company for their generous donation of weighing machines, cases of milk, feeding bottles, etc.

There is a Chinese Amah attached to this branch who has been an invaluable help in interpreting. From the opening of the branch in May to the end of the year, 13,837 visits were paid by the Sisters, and 1,533 attendances were recorded at the two clinics—a very creditable start.

19. *The School work of the Department during 1927.*—During the year the boys' schools have been in charge of Dr. K. C. GHOSH and the Girls' Schools in charge of Mrs. (Dr.) C. H. DUKE. Their annual reports, which make instructive reading, will be found as Appendix *K* of the general report. The following summary will give a birds-eye view of the work accomplished in this most important branch:—

SCHOOL DATA.

	By Health Officer, Schools.	By Lady Health Officer, Schools.	Totals.
Number of Schools visited ...	65	6	71
Number of pupils examined ...	7,119	2,935	10,054
School vaccinations performed ...	3,831	158	3,989
Defective vision found ...	568	88	656
„ „ corrected ...	—	19	—
Dental caries found ...	3,679	1,144	4,823
„ „ corrected ...	1,658	366	2,024
Referred to Dispensaries ...	2,325	298	2,623
Visits of Travelling Dispensary to Rural Vernacular Schools	52	—	52
Lantern lectures to Schools ...	12	—	12

An examination of the above figures while showing that valuable work is being quietly and inmostentatiously done by our School Health Officers, disclose two sad facts, *viz.*, that physical defects are far too numerous and secondly that they are not being sufficiently corrected. This last fact I attribute chiefly to the apathy and shortsightedness of the parents, who, by

the arrangement of the School Health Officer, could get their children's defects remedied at a cost which can only be described as ludicrously small. I do not think it is at all grasped by the public that hygiene in schools—both as a matter of precept and of practice—is perhaps the most important of all the factors which are concerned in the making of happy individuals, sound citizens and virile nations.

Until the teachers themselves grasp this—until they are filled with the enthusiasm of hygiene so that it becomes an integral and sub-conscious part of their outlook and life, no real progress will be made and the citizens of the future will have as narrow an outlook as their parents. In the hands of the school teachers lies the destiny of the future, and practically the sole control of all the preventable diseases of mankind. These are strong words, but I am convinced they are justified on a logical analysis.

20. *Meteorology*.—It is generally recognised that the record of meteorological conditions is an important branch of public health. The information in various districts is of value not only from the health point of view, but also to local shipping, to the agriculturalist, to the planter, to the aeronautical traveller and to the scientist. Work was soon begun in this direction after the foundation of Singapore. In 1840, Second-Lieutenant CHARLES MORGAN ELLIOT of the Madras Engineers—a younger brother of Sir HENRY MYERS ELLIOT, Foreign Secretary to the Government of India, was sent to Singapore to establish a “magnetic observatory”. The site selected was in the neighbourhood of the present Sir ARTHUR'S BRIDGE, near the mouth of the Kallang River. Here magnetic observations were taken, and observations of rainfall and temperatures were begun for the first time. Mr. ELLIOT'S other observations in different parts of the Archipelago and all his results were published in the Transactions of the Royal Society of which he was made a Fellow. He later returned to the East where he died in 1852. After his departure there was a considerable hiatus in scientific observation; and it was not until 1862 that definite records have since been continuously kept. In 1869 the Medical Department took over the recording of the rainfall, temperature, humidity and barometer. Since then the records have been taken by Assistant Surgeons in addition to their own duties. One of them—Mr. LEICESTER went to Calcutta in 1881, to learn the work of a meteorological observer, and returned in January 1882. Under Table IV, will be seen a chart of the Rainfall in Singapore taken continuously since 1862. The mean rainfall in Singapore was proved, during this period, to be 94·39 inches per annum. The wettest year has been that of 1913 with 135·92 inches; and the driest 1877 with only 58·37 inches.

In Appendices 10 and 11 will be found a “Summary of Observations” and a “Climatological Summary” of the Singapore Station for 1927. The Station is a 2nd Order (Normal Climatological) Station; and the fiducial temperature for the locality is 269·3 observations. The records were, for long, taken in the grounds of what was once the Singapore General Hospital at Kandang Kerbau, to which place that institution had been moved after occupation of sites at Pearl's Hill and the Armenian Street. Owing to an outbreak of Cholera, however, the General Hospital and the Asylum were removed to Sepoy Lines in July, 1873, and the old buildings at Kandang Kerbau were retained for other purposes, and they are still intact and in use.

The meteorological observations continued to be taken at the same site until recently, when structural alterations to the old hospital necessitated the removal of all the instruments to a neighbouring temporary site in the grounds of Government House.

In reviewing the meteorological conditions in the Settlement of Singapore for the year 1927, there is but little of outstanding interest to record. The

mean temperature was 79.4° F. The wettest month was January with a rainfall of 337.85 m.m.; and the driest month July, with a rainfall of 77.3 m.m.

The mean Relative Humidity was 82%. It is a strange feature that of records throughout all Malaya—although the Relative Humidity is comparatively high throughout the year—after sunset there is an almost constant rise to a night maximum of 98, 99 or more per cent.

On one occasion at least during the year 1925 a strange dry spell was noticed for a few hours. I have seen this on at least half a dozen occasions during the last 20 years, but not during 1927. The humidity rapidly declines to about 48 or 50%. On such occasions, the covers of books will curl and everything will feel dry to the touch. The reason for this phenomenon is hard to understand. They generally come during a South-east Java wind, and seldom last for more than three hours.

Since 1925, I have had a large notice-board with movable indicators displayed in Messrs. John Little's Establishment, in order to provide the public with useful and up-to-date information.

A further effort to bring conditions to the notice of the inhabitants was effected by supplying the three daily papers with daily data. These are now prompt and intelligible instead of belated and cryptic as previously.

21. *Hill Stations*.—An effort is also made to keep the public informed of neighbouring hill station conditions. The returns are telegraphed from Penang, Taiping and Fraser's Hill each week, thus furnishing the travelling public with useful information concerning places to which they may be travelling. This part of the subject leads to further consideration of hill stations in general. There is no doubt that residence in a climate with a mean temperature of 80° F. or more, combined with a high wet-bulb temperature and a high relative humidity, causes a considerable and cumulative wear and tear which necessitates a periodical change to cooler and drier climates.

22. The incidence of Infectious Disease in a great sea-port such as Singapore is always a matter of international interest. Small-pox and Cholera, Plague and Enteric, Dysentery and Phthisis and Malaria are a great septette of tropical infections which, like the poor, are always with us; but the infinite tragedy and pathos of the whole thing lies in the fact that they are all preventible diseases. I am convinced that the key to the situation lies in the school-room from which alone can spring that intelligent personal appreciation and whole-hearted public co-operation without which we shall never be able to efface the all-pervading and disgraceful blot on the page of our much vaunted modern civilisation. Two facts seem to stand out on perusal of the Table in Appendix 4:—

firstly that Cholera is definitely tending to die out, and
secondly that plague, which passed us by on its way from Hongkong to India, in 1896, and only appeared in Singapore in 1900, is now one of our endemic "Sinbads" which simmers without flaring-up, and is kept alive by a bi-focal epizootic.

23. *Child Welfare Work*.—This very important section of Public Health Work has for some time received the careful attention of the Municipal and Government authorities, and of the public.

Beginning with the period of infancy, it is interesting to note in the following table the steady improvement which has taken place in the Infantile Mortality Rate of Singapore during the last five "lustres" (or five yearly periods). For comparison, the figures are given for England and Wales—an advanced temperate-climate type—and the Bombay figures which are still markedly heavy, though showing signs of improvement.

INFANTILE MORTALITY RATES.

Year	BOMBAY		SINGAPORE		ENGLAND AND WALES	
	Rate	Lustral mean	Rate	Lustral mean	Rate	Lustral mean
1901	574	533	357	349.7	151	138
1902	543		339.4		133	
1903	532		362.3		132	
1904	459		337		145	
1905	557		352.9		128	
1906	535	445	312.1	338.6	132	117
1907	423		363.9		118	
1908	450		339.9		120	
1909	405		343.5		109	
1910	414		333.8		105	
1911	380	385	345.5	311.3	130	110
1912	448		338.9		95	
1913	381		317.8		108	
1914	385		292.9		105	
1915	329		261.4		110	
1916	387	518	260.2	267	91	91
1917	410		300		96	
1918	590		264.2		97	
1919	653		261.7		89	
1920	552		248.7		80	
1921	667	451	232.7	226.2	83	80
1922	403		209.5		77	
1923	411		265.6		69	
1924	419		214.6		75	
1925	355		228.02		75	
1926	389	...	222.4	...	70	...
1927		...	262.3

I think it may be claimed that the persistent effort to ameliorate the conditions of Child-life in England and in Singapore, has been responsible for the continual descent of the lustral means for five consecutive quinquennial periods—a very satisfactory result.

There is no doubt that the Infantile Mortality Rate is a very delicate index to the general health conditions of a community.

An even more delicate index is to be found in an Arbitrary figure obtained by dividing the Infantile Mortality Return by the Mean Age at Death. This I have designated by the Symbol Δ and called it a "Dyscratic Index". Its value lies in the large number of factors which have a bearing on the index. The "Mean Age at Death" is a figure which for many years past has been largely discredited—I think quite unwarrantably. A lot of rubbish has been talked about its fallacies in dealing with "population-groups". But no one would be so foolish as to apply the "Mean Average at Death" to different

classes for purposes of gauging the general health of a community. Omitting accidents and preventable disease, we should all live to a good old age. If we do not, there is something wrong which ought to be prevented.

In a general community (where the comparative value of this statistic lies) the range of the "Mean Average at Death" figure seems to have an important significance. Still more is it of use when combined with an "Infantile Mortality Return" to form a "dyscratic rate".

The following figures are the last at my disposal:—

<i>Year.</i>		<i>Singapore, I. M. R.</i>	<i>Singapore, M. A. D</i>	<i>Singapore, Dyscratic Index.</i>
—		—	—	—
1916	...	260.2	27.1	7.99
1917	...	300	29.48	9.05
1918	...	264.2	33.95	6.85
1919	...	261.7	33.24	6.39
1920	...	248.9	33.72	5.78

The ideal figure for Δ would be unity; and the further from it, the more serious.

The story of Child Welfare work in Singapore is not of long standing.

It may be said to have begun in October, 1910, when a Municipal Nurse was appointed at Dr. Middleton's suggestion, to secure information regarding conditions of the early lives of the infants and to advise the mothers. Miss BLUNDELL was the first to take up the appointment. A system of instructing and licensing midwives was also inaugurated, and two were so licensed in 1911 after passing an examination. In 1912 a second Nurse was appointed by the Municipality, and in that year they paid 8,855 visits and saw 3,449 infants. The Midwives Ordinance came into force on July 1st, 1917. The good work begun by the Municipality is to-day undertaken with unabating enthusiasm, under the stimulating leadership of the present Municipal Health Officer—Dr. HUNTER. There are two Child Welfare Clinics—one at Prinsep Street and one at Kreta Ayer, in each of which an European Sister is in charge, and to each four Asiatic Health Visitors are attached.

As a supplement to this Municipal work a Child Welfare Society was started by the Public in 1923. All the help which can be given in this direction is to be ardently welcomed, and, moreover, it is very valuable that the public should have a personal interest in matters of this nature.

The moving spirit in founding the Child Welfare Society was Lady GUILLEMARD who took the keenest interest in all matters connected with it. It was incorporated as a Limited Association on September 21st, 1923, under the Straits Settlements Companies Ordinance No. 155. The first Centre was opened at 49, Jalan Besar, and a second centre (opened by Miss HOSE on June 23rd, 1925) has been housed in part of the Chinese Gospel Hall in Teluk Ayer Street, kindly lent by the American Methodist Mission.

The staff consists of two matrons and four Health Visitors and medical attention is provided by the voluntary services of several practitioners. The object of such centres is primarily educational, but this is a point of view which is not very intelligible to the masses, and, in order to bring it home to them, it is necessary to reach them by a method of more obvious appeal—the treatment of their sick children and the issue of milk rations. During 1927 the attendances at Jalan Besar totalled 7,528, and at Teluk Ayer, 8,769. The

children visited in their homes, numbered 16,000 and 14,772 respectively. The 4th Annual Baby Show was held by the Society at the Victoria Memorial Hall on Wednesday, August 17th, 1927.

Year by year this item is getting a larger hold on the popular imagination—a fact which should have useful public health results. The entries for the Show this year increased to 231 and \$740 were distributed in prizes. The Championship of the Show was secured by a Malay Infant this year, for the first time.

In addition to the Annual Show, the Society also gives a monthly prize distribution on the first Saturday in each month, with a first prize of \$5 and a second prize of \$1 or \$2 for the healthiest, fattest and cleanest babies amongst those present on that morning. This has proved very useful in making the centres known and appreciated.

24. Concluding Paragraph.

As I am just retiring after 30 years of Government Service, of which 25 have been spent in the Straits Settlements, I should like to take this opportunity of thanking all those members of my staff who have laboured with me through the burden and heat of many a long day. It would be invidious to single out any names for mention, for each and all will ever remain with me as a grateful memory; for they have helped to build a noble structure which should have a future of ever-increasing usefulness— a future—

“Behind whose twilight wait unseen
A perfect earth, perfected man;
To finish all that we began,
To be what we would fain have been”

IRE TAMEN RESTAT.

GILBERT E. BROOKE,
*Chief Health Officer,
Singapore.*

APPENDIX 1

(a) STATISTICAL PRECIS FOR GOVERNMENT HEALTH OFFICE

ADMINISTRATION FOR 1927.

I. *Staff—*

Number of Health Officers	...	...	...	7
Number of Inspectors 8, Vaccinator 1, Overseers 5, Mosquito collectors 3, etc.	...	...	...	17
Number of Clerks and Interpreters	...	...	...	7
Total Quarantine Station staff	...	...	...	106
Number of Rural Mandores, Masons, etc., or Number of Coolies employed in Rural Districts	...	...	...	226

II. *Populations controlled: as regards Health Work—*

Estimated Rural Population	...	...	...	82,577
Contacts quarantined	...	...	...	20,169
Gaol inmates (daily average)	...	...	...	1,380
Reformatory inmates (daily average)	...	...	...	98.49

III. *Populations Casually or partially controlled as regards health work—*

Immigrants, etc., examined	...	...	...	643,066
Government Officials in Singapore	...	...	...	6,131
Pupils in Government and Aided Schools	...	...	...	11,666
Pupils in Vernacular Schools	...	...	...	2,233

IV. *Finance—*

				\$	c.
Budget appropriation for 1927	...	...	...	366,310	00
Revenue recovered	...	...	...	15,170	00
Bills of Health Quarantine Station Maintenance Charges	...	...	...	6,716	00
Coffin Exports	...	...	...	390	00
Quarantine and Fumigation Certificates	...	...	...	31,896	00
Anti-malarial Works refunds	...	...	...	9,164	00
Rural Board Health Budget reckoned against House assessment	...	...	...	43,100	00
Net cost of the Department	...	...	...	259,874	00
Net cost to Public on account of health work reckoned per head of populations in Items II and III above	...	...	...		34
Total	...	...	...	732,620	34

APPENDIX 2

<i>Year</i>	<i>Small-pox</i>		<i>Cholera</i>		<i>Plague</i>		<i>Enteric Fever</i>	
	<i>Cases</i>	<i>Died</i>	<i>Cases</i>	<i>Died</i>	<i>Cases</i>	<i>Died</i>	<i>Cases</i>	<i>Died</i>
—	—	—	—	—	—	—	—	—
1892	...	64	20	—	—	—	4	4
1893	...	119	69	7	7	—	9	9
1894	...	43	10	1	1	—	7	4
1895	...	17	3	430	318	—	16	15
1896	...	24	7	592	437	—	186	96
1897	...	38	17	54	44	—	55	44
1898	...	84	39	7	7	—	82	42
1899	...	316	103	3	3	—	88	28
1900	...	197	81	224	194	1	122	56
1901	...	47	12	133	120	16	112	54
1902	...	159	58	842	737	4	301	218
1903	...	109	30	226	184	3	148	64
1904	...	33	9	3	3	20	179	70
1905	...	20	11	16	15	19	233	95
1906	...	33	10	191	171	10	186	76
1907	...	8	2	205	187	15	353	134
1908	...	27	4	133	127	12	247	113
1909	...	41	7	82	77	5	235	83
1910	...	415	135	132	130	5	84	46
1911	...	254	84	235	235	33	152	100
1912	...	59	29	121	114	38	126	74
1913	...	19	6	97	79	1	111	65
1914	...	13	3	274	211	15	109	69
1915	...	18	7	9	5	34	89	53
1916	...	70	20	13	8	23	103	42
1917	...	33	7	8	7	45	120	57
1918	...	11	5	—	—	176	287	115
1919	...	14	3	75	58	11	174	77
1920	...	4	2	33	32	61	129	80
1921	...	150	33	1	1	28	127	100
1922	...	268	58	1	1	39	71	47
1923	...	3	1	—	—	53	76	34
1924	...	5	1	11	6	20	88	36
1925	...	10	2	1	1	57	94	46
1926	...	34	—	21	—	4	—	—
1927	...	—	—	—	—	—	—	—

APPENDIX 3

<i>Year</i>		<i>Crew and Passengers examined</i>	<i>Passengers sent to St. John's Island</i>	<i>Visits to Vessels</i>	<i>Bills of Health issued</i>
—		—	—	—	—
1903	...	321,365	21,253	806	1,000
1904	...	279,297	17,852	712	1,036
1905	...	323,431	12,109	1,279	1,220
1906	...	493,021	30,076	1,625	1,674
1907	...	377,325	25,408	1,226	1,318
1908	...	303,484	29,356	1,506	1,344
1909	...	291,625	15,072	1,251	1,299
1910	...	467,868	35,062	1,920	1,200
1911	...	538,291	53,961	2,100	1,800
1912	...	539,677	56,726	1,927	2,145
1913	...	506,925	56,838	1,818	1,582
1914	...	402,583	18,193	1,803	1,802
1915	...	200,978	3,335	821	1,563
1916	...	426,584	9,738	1,617	1,726
1917	...	277,442	78,881	694	1,915
1918	...	284,198	24,182	1,709	2,086
1919	...	411,921	28,318	2,130	2,160
1920	...	507,176	31,991	2,023	2,878
1921	...	511,747	8,950	1,851	2,951
1922	...	369,072	15,343	1,552	2,720
1923	...	395,583	7,374	1,360	2,718
1924	...	408,419	39,053	1,433	2,912
1925	...	366,671	46,063	1,018	3,204
1926	...	550,443	78,963	1,650	3,273
1927	...	643,066	20,169	1,568	3,071
Total		10,162,191	874,266	37,399	50,597

APPENDIX 4

STATISTICAL PRECIS OF SHIPPING WORK FOR 1927

1.	Number of ports from which vessels arrived	...	...	349
2.	Names of ports against which quarantine measures were declared during the year—			
	Abadan, Amoy, Basrah, Bangkok, Batavia, Bombay, Bassein, Bandjermasin, Calcutta, Canton, Chingwantao, Haipong, Hong Kong, Hoihow, Kuching, Karikal, Madras, Macao, Mohammed-rah, Negapatam, Pondicherry, Perak, Rangoon, Swatow, Samarinda, Saigon, Shanghai, South Siam, Touraine, Tuticorin, Teluk Anson, Tanjong Balei and Tsingtao.			
3.	Total tonnage entering Singapore	...	...	13,625,155
4.	Number of ships entering port	...	...	8,982
5.	Ships examined	...	...	1,568
6.	Number of pilgrim ships to Jeddah	...	...	33
7.	Pilgrims examined (out-going)	...	...	25,161
8.	Returning pilgrim ships	...	...	22
9.	Returning pilgrims examined	...	...	20,028
10.	Infected ships	...	...	26
11.	Fumigation and disinfection by disinfecting launches	...	...	371
12.	Fumigation by Cyanide chloride gas	...	...	1
13.	Disinfection certificates issued	...	...	355
14.	Revenue from disinfection certificate fees and fumigation charges	...	...	31,896
15.	Crew examined	...	...	127,173
16.	Passengers examined	...	...	515,893
17.	Passengers Undertakings issued	...	...	136
18.	Chinese emigrants examined	...	...	359,262
19.	Bill of Healths issued	...	...	3,071
20.	Revenue from Bill of Health fees (37 free)	...	...	15,170
21.	Revenue from Pilgrim Bill of Health fees	...	...	165
22.	Corpses inspected in harbour	...	...	87
23.	Permits to import and export corpses issued	...	...	39
24.	Revenue from above permits	...	...	390
25.	Water-boats examined	...	...	12
26.	Rats examined	...	...	37
27.	Recovered cost of water	...	...	6,716.20
28.	Prosecutions	...	...	2

(I) 1.—*Marine Court Case No. 595—*

On 14th November, 1927, the Serang of the Motor Boat *Fuji III* was prosecuted for being within 200 yards of the s.s. *Seang Bee* which was infected with Cholera, and

2.—*Marine Court Case No. 596—*

TEO GANG was prosecuted for communicating with the s.s. *Seang Bee* at the Quarantine Anchorage.

Both were fined \$50 each or 28 days rigorous imprisonment. Fines were paid.

(II) LIM KAH CHEE and EE LEONG CHUA were charged with going alongside the s.s. *Hock Seng* (infected with Small-pox) at the Quarantine Anchorage with their Bum-Boat. They were fined \$10 each or 7 days rigorous imprisonment. Fines were paid.

APPENDIX 5

STATISTICAL PRECIS OF QUARANTINE STATION FOR 1927

1.	Total passengers admitted during the year	...	...	20,169
2.	Greatest number admitted in any one day (17/6/27)	...	...	2,072
3.	Maximum number in residence on any one day (22/6/27)	...	...	2,774
4.	Minimum number in residence on any one day (2/12/27)	...	...	24
	(Note—on 231 days there were none in residence) Camps	...	...	Nil.
5.	Total sick treated in Hospital, <i>i.e.</i> , total admissions during the year and patients remaining in Hospital on 31/12/26	...	...	310
6.	Average daily number of sick in Hospital	...	...	6.063
7.	Maximum number in Hospital on any one day (24/3/27)	...	...	31
8.	Minimum number in Hospital on any one day (6/1/27)	...	...	1
	(Note—on 30 days there were none in Hospital)	...	...	Nil.
9.	Total deaths during the year—In Hospital 44; Outside	39	...	83
10.	Death-rate amongst total treated per mille	...	...	14.193
11.	Total number of deaths amongst cases treated	...	...	44
12.	Total cases of cholera admitted	...	...	15
13.	Total cases of plague admitted	...	...	Nil.
14.	Total cases of small-pox admitted	...	...	19
15.	Total rainfall	...	...	118.457 (inches).
16.	Greatest rainfall in 24 hours (3/5/27)	...	...	5.910 (inches).
17.	Total number of rainy days	...	...	201
18.	Number of Vaccination	...	...	9,518
19.	Corpses sent for P. M. Examination and Burial	...	...	5
20.	Number of Municipal contacts and patients admitted— Cholera contacts	...	...	192
21.	Number of Government contacts and patients admitted— Cholera contacts	...	...	399
22.	Number of Municipal contacts who developed infectious diseases on the Island	...	...	Nil.
23.	Number of Government contacts who developed infectious diseases on the Island	...	...	10
24.	Number of Non-infected ships whose passengers subsequently developed infectious diseases on the Island (none out of 157)	...	...	Nil.
25.	Number of infected ships whose passengers subsequently developed infectious diseases on the Island (6 out of 17)	...	...	6
26.	Number of gallons of water distilled during the year	...	...	Nil.
27.	Number of gallons of Singapore water pumped up	...	...	2,727,200
28.	Cases treated as out-door patients (Contact and Staff)	...	...	276
29.	Total Births	...	...	5
30.	Total Re-vaccination	...	...	1,685
31.	Total Inoculation with Anti-Cholera Vaccine	...	...	2,522
32.	Total Inoculation with Anti-Meningococci Vaccine	...	...	Nil.

APPENDIX 6

S. S. SANITARY INSPECTION SHEET

FOR RURAL BOARD AREAS,

(Approved by Chairmen of Rural Boards, Straits Settlements, Vide G. H. O. 50/21)

کصیحاتن

جکاو اد پاموق ۲ اتو تیکوس اتو کوتر ۲ ددالم رومه مک توهن منورنکن فپاکیت کفدائ

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Register No.	Village or Locality	House No. (if any)	Name and Address of Owner	Number of Rooms	What Food-stuffs sold, if used as shop

REFERENCE	REGISTER No.....
No. of occupants (1) Adults, (2) Children at date of inspection. 1	NOTHING SHOULD BE WRITTEN IN THIS SPACE.
Child Vaccination : 33.15, sec. 31. 2	
Re-vaccination after Exposure : 33.15, sec. 42. 3	
Well-water supply : 8.13, sec. 225 (h) (i) N. 19.20, secs. 152-5. 4	
Rubbish Disposal : 8.13, sec. 127. 19.20, sec. 150. 5	INSPECTION-SLIPS SHOULD BE ATTACHED WITH PAPER FASTENERS AS REQUIRED.
Sale of Unwholesome Food : 8.18, sec. 180. 15-14. 6	
Dirty Latrines : 8.13, sec. 198. 19.20, secs. 157-8. 7	Completed slips should only be detached, and filed, when the first column of a new slip is about to be filled in. On no account remove the slip when the third column has only just been filled in.
Night-soil Removal : 8.13, sec. 204. 8	
Whitewashing : 8.13, sec. 215. 19.20, sec. 151 (3). 9	
Rat-destruction : 8.13, sec. 216. 10	
Overcrowding : (350. c.ft. 8.13, sec. 218. 19.20, secs. 146-151. 11	[The following is the translation of the Malay and Chinese Notices hereon : “If you have mosquitoes, rats, or a dirty house, Heaven may bring sickness on you : Therefore always keep the house clean.” “The Doctor and Inspector only come to help you. Please assist them by doing what they ask.”]
Foul Drains : 8.13, sec. 225 (b) N. 12	
Animals, how kept : 8.13, sec. 225 (c) N. 13	
Foul Deposits : 8.13, sec. 225 (d) N. 14	
Standing Water : 8.13, sec. 225 (i) N. 15	
Mosquito-breeding : 38.19, sec. 4. 16	
ADDITIONAL 17	
REMARKS.	
DATE AND INITIALS. 18	

مک دقتور اتو انسفتکر داتغ مرقسا هندق منولغ کامو دان هندقله مریکئیة دتولغ اف ۲ یفدکهندقکي

APPENDIX 7

(d) STATISTICAL PRECIS OF RURAL WORK FOR 1927.

Data—

Estimated Population	...	...	...	82,577
Estimated number of houses	...	...	...	11,883
Number of Police Stations	...	...	...	32
Number of Malay Vernacular Schools	...	...	...	32
Number of Markets	...	...	...	3
Number of Incinerators	...	...	...	22
Registered Piggeries	...	...	...	510
Birth-rate	...	...	...	37.29
Death-rate	...	...	...	34.31
Infantile Mortality Rate	...	...	...	262.3

Work Done—

Visits to houses by Sanitary Inspectors	...	...	...	12,796
Number of Nuisance Notices served	...	...	...	1,124
Prosecutions	...	...	...	5
Cubic feet of Rubbish consumed	...	...	...	1,229,634
Plague cases dealt with	...	...	...	Nil.
Cholera cases dealt with	...	...	...	3
Small-pox cases dealt with	...	...	...	12
Vaccinations performed	...	...	...	8,053
Water samples sent for analysis	...	...	...	61
Subsoil pipes laid	...	...	...	5.43 miles
Oil used for spraying	...	...	...	48,871 gallons

APPENDIX 8

TRAVELLING DISPENSARY SINGAPORE

PROGRESS REPORT

—	May	June	July	August	September	October	November	December
Attendances ...	143	832	1,348	1,889	2,540	3,500	3,318	2,082
Treatment of Sick	143	751	968	990	1,270	1,165	1,110	1,040
Men	61	271	348	344	461	371	396	599
Women	26	113	251	163	254	274	224	151
Children	56	367	369	483	555	520	490	290
Blood films examined								33
BT	7	91	102	208	13	162	121	93
Q	3	6	19	29	0	18	21	28
ST	0	2	0	24	0	1	0	8
Mixed T	2	17	30	5	0	16	18	17
Neg.	1	7	5	12	0	6	12	0
	1	59	48	138	13	121	70	40
Stools examined								
Anky	2	13	26	112	7	98	94	—
Roundworm	1	8	5	14	3	9	14	—
Neg.	0	4	14	31	2	16	48	—
Vaccinations	1	1	7	67	2	70	32	—
Re-vaccinations	4	36	52	21	20	28	42	34
	0	3	4	8	2	—	—	—

APPENDIX 8—Continued

TRAVELLING DISPENSARY SINGAPORE—Continued

PROGRESS REPORT—Continued

—	May	June	July	August	September	October	November	December
No. of working days ...	16	22	21	24	26	24	20	20
Mileage ...	362	832	768	880	816	901	960	858
Cases taken to hospital ...	2	4	6	11	3	17	3	—
Cases taken to Dispensary	—	—	5	9	4	10	7	—
<i>Sputum examined</i>	—	—	—	12	0	7	9	—
T.B. ...	—	—	—	7	0	4	2	—
Negative ...	—	—	—	5	0	3	7	—
<i>Leper smear examined</i>	—	—	—	4	0	2	3	—
Negative ...	—	—	—	4	0	1	3	—
Positive ...	—	—	—	—	—	1	—	—
<i>Nationalities treated—</i>								
Chinese	103	516	768	702	900	686	672	635
Malay	5	86	39	98	170	236	212	211
Indian	35	67	132	64	183	88	126	191
Javanese	—	52	29	36	17	155	96	—
Eurasian	—	30	—	—	—	—	4	3

APPENDIX 9

SUMMARY OF OBSERVATIONS AT FIXED HOURS

YEAR 1927

STATION SINGAPORE

Temperature Scale used below Fahrenheit

Latitude Longitude °

Hours of Observation	I h. 9 a.m. II h. 3 p.m. III h. 9 p.m.	Height above M. S. L. Hight above Ground	BAROMETER	STEVENSON'S SCREEN	RAIN GAUGE	ANEMOMETER
			Cistern	Site	Site	Head
			m. 35'83 ft. m. 2'50 ft.	m. 35'83 ft. cm. 5 ft. 4 in.	m. 33'33 ft. m. 1 ft.	m. 63'33 ft. m. 30'00 ft.

MONTH	MEAN PRESSURE		TEMPERATURE			HUMIDITY						AMOUNT OF CLOUD 0—10			NUMBER OF DAYS OF		WIND: NO. OF OBSERVATION													
	At Station Level at hours of observa- tion	Differ- ence from Normal	I	II	III	Depression of Wet Bulb			Vapour Pressure			Percentage			I	II	III	Clear Sky*	Over- cast*	Wind force 8 and above	Strong Wind (4—7)	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.
						I	II	III	I	II	III	I	II	III																
January	m. b.	m. b.	79.4	83.1	77.6	76.1	77.6	75.4	m. b.	m. b.	m. b.	84.5	77.6	89.7	7.2	8.2	6.0	...	7	...	...	9	33	8	...	5	...	7	1	30
February	1008.6	...	80.5	83.7	78.6	76.7	77.6	76.0	28.7	29.4	29.0	84	74	87	6.2	7.6	3.6	...	4	...	...	2	32	34	...	5	...	3	...	8
March	1009.8	...	82.0	83.8	79.5	77.2	78.1	76.7	29.5	28.9	29.8	82	77	86	6.6	7.7	4.8	...	6	...	...	1	20	38	4	10	1	11	...	...
April	1007.2	...	81.6	84.0	79.5	78.0	78.9	76.9	30.5	29.8	29.8	85	79	89	7.6	7.1	4.7	...	3	...	...	11	15	18	3	11	5	20	6	11
May	1007.8	...	83.0	85.7	81.0	78.8	79.2	77.8	31.3	30.5	31.2	82	77	88	6.8	6.5	4.7	...	3	...	...	3	9	7	5	18	10	28	8	5
June	1008.1	...	82.0	86.0	81.1	78.7	79.0	78.0	31.0	30.3	29.5	83	69.8	84.1	6.6	6.2	4.7	...	6	...	...	1	2	10	1	34	7	23	2	10
July	1008.2	...	82.6	87.1	81.8	78.6	79.2	78.1	31.4	30.7	30.9	83	71	82	7.0	6.0	3.5	...	5	...	...	2	...	4	3	46	5	24	2	7
August	1008.3	...	82.6	85.8	81.8	77.8	78.4	77.6	30.4	29.9	30.4	80	72	85	6.6	6.9	4.2	...	7	...	...	5	2	4	1	50	7	14	4	6
September	1009.7	...	82.4	84.4	79.8	78.1	78.4	77.1	30.8	30.2	30.2	82	76	88	6.8	7.0	5.0	...	8	...	...	5	6	6	3	40	10	16	2	2
October	1009.6	...	81.9	83.3	78.6	77.6	78.1	76.6	30.1	30.2	30.5	82	79	89	7.3	8.1	5.0	...	9	...	...	5	8	15	3	16	6	28	3	9
November	1009.4	...	80.2	84.0	79.2	77.4	78.0	76.3	30.3	30.5	30.7	87	78	90.6	7.8	7.9	4.6	...	10	...	...	7	22	25	...	7	1	17	5	6
December	1009.2	...	80.7	83.8	78.4	77.0	78.0	76.0	30.0	30.0	29.5	84	77	90	7.5	7.4	5.3	...	9	...	...	2	24	44	1	1	...	3	...	18
Year { Total { Mean	...	...	81.6	84.5	79.7	77.6	78.4	76.9	...	...	...	...	...	...	...	7.1	...	...	77	...	...	53	173	213	24	243	42	194	33	120
	1008.6	...	81.6	84.5	79.7	77.6	78.4	76.9	30.8	30.1	30.0	83.2	75.6	87.3	7.0	7.1	4.6	...	...	...	...	...	...	...	...	...	...	...	...	...

On a day of clear sky the Mean Cloud amount at hours of Observation 2; on an over cast day 8

APPENDIX 10

CLIMATOLOGICAL SUMMARY

STATION SINGAPORE

Latitude 1° 18' 27" N. Longitude 103° 50' 58" Observation at 9 A.M. 3 P.M. 9 P.M.

Height { Site of Rain Gauge } H=33.33 ft. Heights { (above) : Thermometer ht.=5.33 ft.; Sun Recorder hr.=9 P.M. Temperature for 24 hours ending 9 P.M.
(above mean Sea Level) { Ground } ft.; Rain Gauge hr.=9 A.M.

AIR TEMPERATURE IN DEGREES FAHRENHEIT										RAINFALL				WEATHER NO. OF DAYS OF							BRIGHT SUNSHINE								
MONTHS	Mean of		Max. and Min. combined	Difference from Normal	Absolute Extremes						Highest Wet Bulb	Total			Differ- ence from Normal	Maxi- mum	Day	Precipitation	Difference from Normal	Snow	Hail	Thunder storm	Fog	Ground Frost	Gale Force 8 or more	Daily mean	Total	Per cent	Total Possible
	Max.	Min.			Highest Max.	Day	Lowest Min.	Day	Lowest Max.	Day		Highest Min.	Day																
1928	°	°	°	°	°	°	°	°	°	°	m. m.	m. m.	m. m.												hr.	hr.	%		
January	85.2	73.1	79.2	..	90.5	18	71.0	3	79.0	2	74.6	16	83.0	337.85	- 7.81	60.45	31	26	+7	..	..	..	..	..	3.11	98.41	..	..
February	85.9	73.7	79.8	-4	90.0	17	70.0	3	78.5	3	76.5	27	81.2	139.90	-62.55	26.48	19	17	+4	..	..	..	..	..	5.9	144.12	..	..
March	88.4	74.8	81.6	-3	92.0	14 & 17	72.2	7	83.0	8	76.0	5 11 & 12	83.0	307.22	+90.93	74.34	4	20	+6	..	..	..	..	..	5.19	164.49	..	..
April	87.5	74.7	81.1	-4	91.5	15	72.5	21	82.8	29	76.5	28	83.5	274.05	+123.57	56.71	21	20	+8	..	..	..	..	..	3.52	116.0	..	..
May	88.5	74.9	81.7	+2	92.0	31	73.0	9 & 12	81.5	3	78.2	28	83.2	237.01	+38.15	72.91	2	17	+2	..	..	..	..	..	5.3	156.33	..	..
June	88.1	75.1	81.6	+2	91.2	2 & 5	73.0	23	81.0	4	80.7	14	83.2	138.29	-11.43	28.35	9	16	+3	..	..	..	..	..	4.57	148.30	..	..
July	88.5	74.9	81.7	+3	91.6	30	71.0	10	83.0	5	79.5	26	83.5	77.20	-91.90	27.42	2	12	..	..	..	..	..	..	5.36	176.36	..	..
August	88.5	74.8	81.6	+5	91.5	4	71.2	27	83.2	24	77.9	18	83.3	165.22	-47.86	72.68	22	14	..	..	..	..	..	..	5.24	167.24	..	..
September	87.6	74.6	81.1	-1	90.3	7	73.1	30	82.0	25	76.5	2	82.0	159.10	-30.54	37.08	30	17	+5	..	..	..	..	..	4.58	149.0	..	..
October	86.8	73.7	80.2	+2	91.0	20	71.0	7	78.5	1	75.2	20	81.5	220.04	-17.77	52.03	9	20	+5	..	..	..	..	..	4.16	132.16	..	..
November	86.3	73.9	80.1	-7	90.7	20	72.0	15	79.3	9	75.3	22	82.5	232.07	-25.43	69.33	10	23	+7	..	..	..	..	..	4.7	123.30	..	..
December	86.3	73.8	80.0	..	89.3	16	72.0	24	83.2	5	75.0	12 & 16	80.5	298.38	+87.09	110.61	25	20	+3	..	..	..	..	..	3.22	104.22	..	..
Total ...	...	...	...	...	...	...	...	...	...	...	...	14th June	...	2876.43	+44.45	...	...	222	+50	...	...	...	...	...	...	1678.53	...	...
Year { Mean or Extreme	87.3	74.3	80.8	-5	92.0	14th Mar. 31st May	70.0	3rd Feb.	78.5	3rd Feb.	80.7	14th June	...	...	...	110.61	25th Dec.	...	...	...	...	...	...	...	4.32	...	...	...

SINGAPORE (RURAL).

BY J. W. SCHARFF, M.D., D.P.H., D.T.M. AND H.

1. The island of Singapore contains an area of 217 square miles. The Municipal area is 29 square miles in extent, the remainder, termed "rural" is principally agricultural land interspersed with villages tenanted partly by field labourers and to an increasing extent by town workers. The rural area situated outside the municipal city boundary, includes also many islands in the vicinity of the port. The population, estimated to be 82,577, is in all probability considerably in excess of that figure owing to the rapid expansion of the city consequent upon improved methods of transport. The average density of the population is 438 persons to the square mile, but large sections in the north and northwest of the island are uninhabited while the mukim of Siglap is so thickly populated that it presents all the problems of an overcrowded urban area.

2. For administrative purposes the rural area is divided into five sanitary districts as follows:

<i>Sanitary District</i>	<i>Area in square miles</i>	<i>Estimated population</i>	<i>Estimated number of houses</i>
Siglap ...	31.5	24,536	4,720
Paya Lebar ..	33	17,017	3,272
Seletar ...	40	9,216	1,772
Bukit Timah ...	53	12,000	2,307
Pasir Panjang ..	31	19,808	3,809

There is a district depôt with an office for the sanitary inspector and a store in all but one of these districts. These depôts form the district health units from which health propaganda and child welfare work is directed.

3. *Staff.*—An Assistant Health Officer (Dr. P. C. FERNANDEZ) is in charge of the general sanitation of villages and estates, while a Chief Sanitary Inspector (Mr. H. S. HOPKINS) with a training in sanitary engineering is responsible for anti-malarial drainage and other mosquito control measures. Two Health Sisters, the first arriving in January and the other in May, have been engaged in a very thorough child welfare campaign in the villages and kampongs.

There are five district sanitary inspectors and a staff of mosquito collectors, sanitary overseers, mandores (overseers) and coolies.

5. *Statistics.*—The following table shows a comparative statement of the population, deaths, births, and infantile mortality rates for the years 1921 - 1927 inclusive.

<i>Years</i>	<i>Estimated population</i>	<i>Deaths</i>	<i>Death-rate</i>	<i>Births</i>	<i>Birth-rate</i>	<i>Infantile Mortality Rate</i>
1921 ...	60,003	2,161	31.77	1,942	28.55	233.9
1922 ...	70,432	1,984	28.17	2,043	29.01	209.5
1923 ...	72,861	2,019	27.71	1,864	25.58	265.6
1924 ...	75,290	1,957	25.99	2,641	35.07	214.6
1925 ...	77,719	1,994	25.65	2,298	29.56	228.02
1926 ...	80,148	2,637	32.90	2,760	34.43	224.4
1927 ..	82,577	2,834	34.31	3,080	37.29	262.3

The rise in the death-rate during 1926 and 1927 is due to a combination of factors amongst which the chief cause appears to be the continuation of the 1926 malaria wave.

The normal ratio of births to deaths in Malaya is 3.2 or an index of 1.5. When deaths increase relatively to the births in any area the index for that

area becomes smaller on the other hand where conditions of life are particularly favourable, so that births increase relatively to the deaths, the index becomes large, as in Tanjong Kling, where the 1926 index was 2.43.

Police Stations	Total Number of Deaths			Total Number of Births			Birth-rate Ratio		
	1925	1926	1927	1925	1926	1927	1925	1926	1927
Pasir Panjang	68	63	96	93	87	106	1.36	1.21	1.10
P. Bukom Kechil	44	41	62	61	60	81	1.38	1.45	1.30
Tanjong Kling	36	32	58	63	78	91	1.75	2.43	1.56
Keppel Harbour	134	153	219	150	161	155	1.11	1.05	.70
Alexandra Road	41	178	162	21	120	124	.51	.67	.76
Wayang Satu	42	110	113	26	67	53	.61	.61	.46
Bukit Timah	124	134	144	131	149	212	1.95	1.11	1.47
Bukit Panjang	111	151	99	118	160	179	1.06	1.05	1.80
Woodlands	21	31	37	21	17	17	1.00	.54	.46
Thomson Road	110	123	118	58	55	43	.52	.44	.36
Chua Chu Kang	70	131	146	105	135	146	1.50	1.03	1.00
Paya Lebar	280	379	343	243	282	341	.87	.74	.99
Serangoon	104	135	92	196	201	223	1.88	1.43	2.42
Geylang	366	453	547	446	476	535	1.21	1.05	.97
Siglap	164	198	258	217	273	292	1.32	1.37	1.13
Bedoh	109	119	135	156	188	219	1.44	1.57	1.62
Changi	70	94	83	91	134	119	1.30	1.42	1.43
Pulo Tekong	100	112	122	102	116	144	1.02	1.03	1.08
TOTAL	1,994	2,637	2,834	2,208	2,760	3,080	1.15	1.04	1.08

It will be seen that the figures collected for the past three years have remained remarkably constant.

6. *Infectious Diseases*.—There were ten cases of small-pox and only one case of cholera during the year. The latter occurred amongst a gang of coolies living in Seletar and was probably an imported infection. The usual precautions were taken and were successful in avoiding the spread of the disease. Amongst the 10 cases of small-pox reported and discovered, all but one occurred in the Siglap area, two were found after death and seven were concealed cases.

Amongst the minor infectious diseases 2 cases of diphtheria and 3 cases of chicken-pox were reported. One case of Enteric Fever was reported from Ponggol and a contaminated well which proved to be the source of infection was closed. Nine fatal cases of Pulmonary Tuberculosis only, were registered; there is little doubt that this disease is claiming an increasing number of lives in all parts of the country.

Twenty thousand five hundred and thirty-five vaccinations were carried out by the Government Vaccinator with the assistance, in cases of urgency, by the sanitary inspectors and the dresser of the travelling dispensary. These figures include the vaccinations performed on a large number of pilgrims who left for the Hedjaz. Of the 8,053 vaccinations and re-vaccinations in the rural area the following results were obtained.

	Perfect	Modified	Failed	Not seen	Total
Primary vaccinations	2,002	12	63	161	2,238
Re-vaccinations	1,273	26	3,263	1,253	5,815

The population of the rural area is receiving adequate protection from small-pox infection by a steady campaign of vaccination and re-vaccination.

7. *General Sanitation and Village Conservancy*.—Under this heading are included house to house inspection, village scavenging, control of night-soil removal and disposal, control of piggeries, cattlesheds and dairies, inspection of markets, surveys of sites and building plans, sanitary supervision of Police Stations, rubber estates and factories, control of water supplies, sanitary control of schools,

The estimated number of houses in the rural districts is 15,880 and 12,796 routine house to house inspections were made by the District Sanitary Inspectors. A number of similar inspections in cases of difficulty and complaint were carried out by the Health Officer and his assistant.

The sanitation of Government buildings and crown land within the municipal limits was supervised regularly and 386 visits are recorded by the health officer under this heading; while routine monthly inspections were carried out by the Sanitary Inspector (town), and the Mosquito-Collector, of all Government Offices and quarters. Village scavenging and refuse collection is organised by the health branch and all the villages of the island are served with one or more incinerators according to their needs. There are 21 such incinerators and during the year more than 43,000 cubic yards of rubbish was consumed.

Considerable advance has been made during the year in the control of soil pollution. A Chinese conservancy overseer was engaged in March and has rendered possible the extension of a scheme of control which includes the supervised erection of Sanitary latrines and the organised collection and disposal of nightsoil in all but one of the Sanitary districts. An experimental trenching ground of 2 acres of land off the 8th mile West Coast Road designed to serve for the whole of the Pasir Panjang district was completed in June and has proved a complete success.

In Bukit Timah, where no suitable land for trenching exists, an experimental dumping septic tank, designed and erected departmentally at a cost of \$3,300, has been working satisfactorily since July. The water supply for this septic tank flows from the subsoil pipes in a valley which had been drained as an anti-malarial measure in 1923. The septic tank deals with the nightsoil of 600 persons daily.

Eighty demonstration concrete box latrines have been distributed in certain chosen centres in the kampongs (hamlets) and villages at Pasir Panjang, Geylang and Siglap.

Four hundred and seventy-three insanitary latrines were demolished and 514 new latrines erected by owners of houses. All new buildings to the number of 1,012 erected in village areas and all coffee shops and large rubber estates in the rural area have sanitary latrines and it is estimated that more than 70% of all dwellings are adequately sanitated. This satisfactory state of affairs is in no small measure the result of the impetus given to this work by the progress of the Rural Sanitation Campaign.

During the year 298 inspections were made of slaughter houses, 935 visits were paid to dairies and cattlesheds and piggeries to the number of 630 were inspected. Four hundred and fifty-nine minor insanitary conditions were remedied at the verbal instructions of the sanitary inspectors and the assistant health officer. One hundred and seventy warning notices were served on owners requiring compliance with sanitary requirements. There were seven prosecutions and five convictions for failure to comply, with fines amounting to \$180.

There are two markets, both in Siglap district, which were inspected regularly throughout the year. On the recommendation of the health officer, the trustees of Perseverance Estate authorised the erection of sheds for hawkers stalls which have to some extent relieved the roads in that neighbourhood of the nuisance of insanitary hawking. Sanitary improvements were effected in 422 coffee shops and eating houses owing to the helpful co-operation of the Chief Police Officer who had agreed not to license any shop without the recommendation of the health officer.

Building plans in the rural area submitted to the health officer for approval numbered 339, more than double the number in the previous year. Alterations of the sanitary arrangements re drainage were made in the majority of the plans submitted.

Reports of births and deaths registered at each Police Station are collected and scrutinised. The police co-operate in gathering children for vaccination and in finding the dwellings of new born infants for the health sister.

Rubber Estates and Factories.—Large rubber factories number 29. They afford employment for a large number of coolies who are usually not housed in the factory premises but live in the rural villages or come by lorry from the city. The sanitary arrangements in many of these factories were defective and action was taken to remedy these conditions.

There are 96 rubber estates each with a registered labour force of over 25 coolies. There is a recorded population of 6,730 in these estates; the number of deaths reported totalled 62; a death rate of only 9.21 per mille. Improvements were effected in the coolie lines of 14 estates and sanitary latrines erected in the same number of estates.

Water Supply.—The extension of the municipal water into the rural area has added greatly to the safety of the population from the dangers of a contaminated supply. Thirty-three samples of well water from outlying villages and estates were submitted for analysis and twenty-four were declared fit for domestic purposes. Fifteen wells were condemned and 12 new wells constructed, of these 5 were built in connection with the construction of subsoil drains. These wells cost \$48 to construct.

Schools.—Four hundred and fifteen visits were made to schools of which 8 are English Schools, 7 Vernacular and 18 Chinese. Sanitary improvements were effected in six and two experimental urinals were constructed in Schools along Joo Chiat Place. The sanitation of all government and government aided schools is satisfactory.

Anti-mosquito Work.—The essential feature of anti-malaria measures in rural Singapore has been the organisation of district health units. A district store and coolie lines are established in Bukit Timah, Paya Lebar and Siglap districts while in Pasir Panjang the beri-beri hospital serves as a store and coolie lines are on loan by the war department at Alexandra barracks.

The central supervising and laboratory staff consist of one Chief Sanitary Inspector, one anti-mosquito inspector and two surveyors a laboratory assistant and three mosquito collectors.

The anti-mosquito measures adopted have been progressive. The breeding places for dangerous mosquitoes within 20 chains of the villages of Bukit Timah, Bukit Panjang, Woodlands, Paya Lebar and Pasir Panjang have been oiled, the proximal ravines then drained and the oiling gradually extended further into the country or new protection zones formed, according to the areas where malaria is endemic.

The control work is principally checked by mosquito surveys. More than 8,000 anopheline larvae were collected and identified and 2,376 adult anopheline mosquitoes examined. Spleen surveys, malaria case records and vital statistics of each district also provide material upon which the progress of malaria control is judged.

An annual vote of \$100,000 has been available since the year 1922, and in carrying out this policy of oiling and draining during the past six years more than 56 miles of subsoil pipes and 8 miles of open concrete channels have been laid and a yearly average of 18,000 gallons of oil have been sprayed, protecting an area of some 15 square miles.

There is evidence of a steady improvement in the prosperity and health of the inhabitants in villages where anti-malarial work has been undertaken. The record of this improvement tabulated for the whole of rural Singapore

divided into areas according to the present distribution of malaria is as follows:—

TABLE II

Year	Areas where anti-malaria measures have been in force and extended since 1921 (Bukit Timah, Bukit Panjang, Woodlands, Paya Lebar, Serangoon and Pasir Panjang).			Districts which are normally healthy and where no control measures are required (Siglap, Bedok and Changi).			Villages and Kampongs (hamlets) which are malarial and where no control measures have been instituted.		
	No. of children examined	No. with enlarged spleen	Spleen rate %	No. of children examined	No. with enlarged spleen	Spleen rate %	No. of children examined	No. with enlarged spleen	Spleen rate %
1921	222	74	33.3	154	6	3.8	22	8	36.3
1922	259	57	22.0	266	22	8.0	16	5	31.2
1923	547	52	14.0	69	3	4.3	31	15	48.3
1926	509	19	3.7	254	18	7.0	65	61	93.8
1927	126	7	5.5	120	7	5.8	48	39	81.2

Up to the end of the year 1926 approximately \$320,500 have been spent on anti-malaria work. During 1927 the total expenditure was \$120,196.36. The population protected from malaria by this work numbers approximately 40,000.

A large section of rural Singapore, and some of the most populated areas containing some 32,000 persons is, owing to anti-malarial measures, free from malaria with the exception of small endemic foci near *Anopheles ludlowi* breeding places on the coast.

The breeding places of *Anopheles ludlowi*, so far as they exist in the rural area, are relatively of little importance owing to their small extent and because of the scattered population in their immediate surroundings. This is in contrast to the extent of the breeding places of this mosquito in the neighbourhood of the tidal creeks upon which part of the town of Singapore is situated. The control of *Anopheles ludlowi* by measures to deprive the larvae of suitable breeding places is being undertaken at present, and is no less practicable than the effective control of *Anopheles maculatus*.

Researches into the comparative cost and efficiency of oiling and of anti-malaria drains have been continued. Experiments on the control of *Anopheles ludlowi* with Paris Green have been carried out and will be continued as soon as a larger supply of Paris Green becomes available.

Additions have been made to the "Horn Museum" at the Central Sanitary Depot in Jalan Klapa. A complete record of mosquito breeding places discovered since 1921 is exhibited; plans of mosquito surveys are prepared and collections of mosquitoes are being made.

Student Sanitary Inspectors are taught the practical significance of mosquito identification, and laboratory exhibits and experiments upon the destruction of larvae are supplemented by field excursions and instruction in oiling and drainage methods.

PENANG:

By Dr. A. G. H. SMART, M.B., D.P.H., D.T.M. AND H., Acting Senior Health Officer, Penang.

(a) The administrative districts remain as shown in last year's report, under their respective officers. There were two additions to the European Staff, *viz.*: A Chief Sanitary Inspector and a trained Health Sister who took up duty in August.

(b) Dr. A. G. H. SMART remained in charge as Senior Health Officer, but from the middle of August was also carrying out the duties of Chief Medical Officer. The Senior Health Officer acted in addition as Chairman of the Penang Hills Technical Committee throughout the year.

(c) The Sanitary Inspectors remained in numbers as in the previous year except that the Chief Sanitary Inspector referred to above was appointed. His duties were, however, largely confined to the initiation and carrying out of Anti-mosquito works over the whole Settlement. The Rural Health Officer, Penang, whose status was raised to that of a Deputy Health Officer, was in charge of the Sanitary state of his District. Two additional Sanitary Inspectors are being appointed in 1928.

(d) In view of and to assist the Rural Sanitation Campaign directed by Dr. PAUL F. RUSSELL, under the auspices of the Rockefeller Foundation, special attention was given to the sanitation of villages and Government buildings. On Penang Island a scheme was started in two villages—in one of which, Tanjong Tokong, the scheme was a combined one to carry out the necessary Anti-mosquito work and provide back-lane accommodation.

In Province Wellesley a compulsory system of night-soil removal was started in six villages. This work, which is only really a beginning, owed its inception, and any measure of success it has attained, to the efforts of the respective District Officers concerned. In Bukit Mertajam the latrine system of over about half the extent of the village has been entirely recognised.

Sample type latrines were put up in many places and no doubt the educative propaganda carried out by Dr. RUSSELL and his assistants as well as directly by the Health Branch, has produced definite and permanent efforts.

(e) Some of the most hopeful work of the year has been in connection with the Establishment of Health Centres in Penang and Province Wellesley and the employment of a travelling dispensary on Penang Island as well as in Province Wellesley. The Health Centre in Penang was opened early in August and the work done has included a large amount of Infant Welfare work. The way in which these Centres and the Travelling Dispensaries are attracting people as shown in the statistical part of this report is striking evidence of the real need and demand there is for such work and of the wide-ness and hopefulness of its scope.

The Health Branch work in Penang Island has been carried out in two shop houses in Tanjong Tokong and during the five months of its existence 2,500 attendances were recorded at the Clinics while 1,879 visits were made to persons' own houses.

The Travelling Dispensary at Penang commenced work on the 25th August and up till the end of the year nearly 20,000 attendances had been recorded.

(f) With the advent of a trained European Chief Sanitary Inspector it was possible to carry out a greatly increased amount of permanent Anti-mosquito work and a large programme is estimated for in 1928. Details of this work will be seen in Part II of the Report.

(g) On Penang Hills Station the new water supply from the Tiger Hill Reservoir became available. The sanitation of the Crag Hotel was improved, and some Anti-mosquito drainage was carried out.

(h) Work at the Leper Asylum was continued on the same lines as previously noted and Dr. A. H. WHEATLEY has an increased number of patients who might be termed "cured" but who are retained by him on the non-leper staff for further observation and confirmation.

(i) Considerable structural alterations to the buildings were carried out during the year with great advantage to those occupying them. A definite plan has now been decided on the Camps *E* and *F* and this will be carried out in part in 1928. The figures at the Asylum show no great variation from those of the previous year.

(j) Work at the Quarantine Station was again heavy—the total admitted being 88,849 which is 3,242 higher than last year's total, which was the second highest total on record. Deaths recorded were much the same as the average in previous years.

(k) Port Health work showed a big increase but this was largely due to the number of small craft from the West Coast of Siam which had to be examined. The total number of persons examined was 84,000 over the total for 1926. The Port Health Officer has extra assistance available in case of need.

Twenty persons were charged for breaches of the Quarantine Ordinance and convictions obtained in each case.

(l) Vaccinations carried out were slightly under the total done during the previous year.

(m) Estate work is summarised in Part II of the Report.

(n) The year may be termed an average one with regard to Health conditions generally. The abnormal Meteorological state of the previous year was absent and conditions were not especially trying.

II. PORT HEALTH WORK.

(a) Ships, Junks, Crew units and passengers inspected numbered respectively 998, 2,203, 93,995 and 273,188.

(b) Sixty-three ships were "Infected Immigrant Ships" with a total of 99,184 Labour Department Immigrants on board.

(c) One hundred and twenty-three ships were "Chinese Immigrant Ships", a large proportion of the passengers being immigrant coolies from China.

(d) Eighteen "Pilgrim Ships" left for Jeddah with 14,075 pilgrims. Twelve pilgrim ships arrived from Jeddah and of these four were infected with Small-pox.

(e) Fifteen ships arrived infected with a "dangerous infectious disease" as follows:—

Date of Arrival	Ships	Ports touched at	Infection	Number of cases on board
7-1-27	Teesta ...	Madras and Negapatam	Cholera	1
14-1-27	Tairea ...	Madras and Negapatam	Small-pox	1
2-2-27	Scheldestad ...	Calcutta	Small-pox	1
24-2-27	Takada ...	Calcutta ...	Cholera	1
6-3-27	Ekma ...	Calcutta and Rangoon	Cholera	1
21-3-27	Tilawa ...	Calcutta and Rangoon	Small-pox	2
20-4-27	Kum Sang ...	Hong-Kong ...	Small-pox and Cerebro-spinal Meningitis	2
22-4-27	Tairea ...	Madras and Negapatam	Small-pox	1
19-5-27	Tairea ...	Madras via Port Swettenham	Cholera	1
27-6-27	Thai Sun ...	Port Weld	Cholera	1
5-7-27	Antiochus ...	Jeddah	Small-pox	2
7-7-27	Adrastus ...	Jeddah	Small-pox	4
20-7-27	Peleus ...	Jeddah	Small-pox	2
17-8-27	Glauchus ...	Jeddah	Small-pox	1
15-9-27	Talamba ...	Amoy and Singapore	Cholera	1

(f) The disinfecting launch *Kite* was in use on 35 occasions.

(g) Sixteen water boats of the Port were inspected and samples of water from these were sent for Bacteriological examination.

(h) The following are the statistics of 23 years work at Penang Harbour:—

<i>Year.</i>	<i>Vessels.</i>	<i>Units of Crew and passengers inspected.</i>
1905 ...	869	214,136
1906 ...	675	204,988
1907 ...	633	219,839
1908 ...	1,205	176,119
1909 ...	503	161,971
1910 ...	526	217,967
1911 ..	1,144	277,151
1912 ...	634	287,373
1913 ...	818	272,473
1914 ...	1,040	215,067
1915 ...	405	148,662
1916 ...	662	213,726
1917 ...	376	203,737
1918 ...	551	173,813
1919 ...	493	210,839
1920 ...	432	207,424
1921 ...	461	197,446
1922 ...	480	197,579
1923 ...	442	182,349
1924 ...	461	214,936
1925 ...	417	203,204
1926 ...	885	282,530
1927 ...	3,201	367,183
	17,304	5,050,512

(i) Twenty certificates of disinfection and 60 permits to import, export or tranship coffins containing human remains and 733 Bills of Health were issued. Fees for these amounting to \$4,430 were received.

(j) "Exemption permits" were issued to 104 ships.

(k) Seven certificates to accompany hides were issued.

(l) "Passengers Undertakings" were issued to 145 Cabin passengers from infected ships: three bonds were entered into by relatives or friends of passengers.

(m) Twenty individuals were charged at the Police or Marine Court for offences against Ordinance No. 157. One was cautioned and discharged, the rest were fined from \$5 to \$25 each.

III. QUARANTINE STATION, PULAU JEREJAK.

(a) Accommodation is provided for about 5,000 persons. The highest total in any one day was 4,901 (in July). The average daily total was 1,593 which compares with 1,447 in 1926 and 880 in 1925. The station was never empty during the year.

(b) From 171 ships 88,849 persons were admitted as compared with 85,607 in 1926.

(c) Labour Department Immigrants totalled 53,743.

(d) Deck passengers were 35,106 in number.

(e) From 12 infected ships 14 cases of dangerous infectious diseases and 9,542 contacts of such were admitted and of the latter 35 developed later the particular disease for which they were quarantined.

Some notes are given below of the occurrence of Cholera and Small-pox from such ships.

Five cases of cholera were admitted of which two died and in addition 34 cases occurred on the station with nine deaths. Two cases of Cholera arose among persons landed from so called non-infected ships, one 13 days and the other 18 days after leaving the last port, the last case being 6th September, 1926. With regard to Small-pox a total of 11 cases occurred, of these nine were admitted to the station, one occurred from an infected ship and the other from a non-infected ship.

(f) Altogether three occurrences of the development of a dangerous infectious disease from non-infected ships were noted—2 of Cholera and one of Small-pox.

(g) A record of Hospital Admission is shown below:—

<i>Hospital Statistics.</i>			<i>Cases.</i>	<i>Deaths.</i>
—			—	—
Bright's Disease	...	...	3	—
Chicken-pox	...	...	39	—
Cholera	...	...	42	12
Dysentery	...	...	204	10
Enteritis	...	...	112	10
Influenza	...	...	628	47
L. Pneumonia	...	...	33	6
Malaria	...	...	339	10
Measles	...	...	17	1
Small-pox	...	...	11	2
Other Diseases	...	...	1,233	56
Total			2,661	154

(h) At the Dispensary 2,685 cases were attended—2,039 being males and 646 females.

(i) There were 10 births during the year; five among Indian Immigration coolies, one among passengers and four among pilgrims.

(j) There were 154 deaths during the year among those landed and 16 of these died within 48 hours of landing at the Station. There were 339 cases of Malaria treated with 10 deaths.

(k) Eighty-three thousand six hundred and seventy-five vaccinations were performed with a successful percentage of 71.79.

(l) Anti-hookworm treatment was administered to 48,686 persons.

Carbon tetrachloride was used in doses from $\frac{1}{2}$ to 3 c.c. according to age. During the past $4\frac{1}{2}$ years over 153,000 persons were treated with no untoward result. Infants are excluded and the treatment is only given on the 3rd day after arrival.

All the Indian Immigration Coolies except infants have been inoculated with Cholera vaccine since June last year.

(m) Rainfall totalled 2,151 m.m. over 127 days—the greatest daily fall being 80 m.m. on 5th September, 1927.

(n) A certain amount of permanent Anti-malarial work was done during the year and constant supervision from this point of view was maintained. The health of the staff was good and no fresh cases among them or their families developed.

(o) Dr. P. MEHTA continued to be in charge.

(p) A table is given showing the work carried out in the Quarantine Station, during the past 23 years.

Year	Total admitted	Average number of inmates	Cases of Cerebro Spinal Fever	Cases of Cholera	Cases of Influenza	Cases of Plague	Cases of Small-pox	Vaccinations performed
1905 ...	10,406	171	...	1	...	...	10	No record
1906 ...	23,288	461	...	8	...	...	16	6,490
1907 ...	17,650	116	...	24	...	1	4	5,652
1908 ...	21,175	366	...	9	...	2	51	5,691
1909 ...	23,058	359	...	2	...	1	25	5,614
1910 ...	71,876	1,584	...	33	...	2	62	12,205
1911 ...	134,957	3,470	...	387	...	1	109	73,988
1912 ...	55,493	1,111	...	4	...	4	75	38,297
1913 ...	53,937	120	...	12	..	1	11	37,276
1914 ...	48,399	116	...	9	...	...	171	32,606
1915 ...	23,176	478	...	...	...	...	3	21,542
1916 ...	42,736	817	...	1	8	...	11	36,806
1917 ...	37,595	820	...	12	...	...	11	36,808
1918 ...	33,481	70	...	80	64	...	7	29,536
1919 ...	50,733	1,189	...	264	528	...	6	39,941
1920 ...	43,733	932	...	8	559	...	4	41,230
1921 ...	19,653	353	...	3	39	...	42	10,377
1922 ..	31,247	567	...	...	152	...	6	26,675
1923 ...	24,129	479	...	9	84	...	2	23,359
1924 ...	28,701	634	...	151	171	...	...	25,779
1925 ...	44,984	880	5	47	284	...	8	42,514
1926 ...	85,607	1,447	1	89	324	...	5	77,879
1927 ...	88,849	1,593	...	41	628	...	11	83,675
Total ...	1,014,863	18,783	6	1,194	2,841	14	650	713,940

IV. LEPER SETTLEMENT, PULAU JEREJAK

(a) *Inmates.*—The general health has been good.

Remaining on 31st December, 1926

Colonial	401	} 707
Perak	...	...	...	...	162
Selangor	...	...	...	...	76
Kedah	...	...	...	...	68

Admitted during 1927

Colonial	145	} 164
Perak	...	...	...	...	Nil.
Selangor	...	...	...	...	Nil.
Kedah	...	...	...	...	19

Total treated ... 871

Discharged 1927 ... Nil.

Absconded 1927

Colonial	11	} 17
Perak	...	...	...	...	1
Selangor	...	...	...	...	Nil.
Kedah	...	...	...	...	5

Deaths 1927

Colonial	85	} 122
Perak	...	...	...	...	17
Selangor	...	...	...	...	8
Kedah	...	...	...	...	12

Remaining 31st December, 1927

Colonial	450	} 732
Perak	...	...	...	...	144
Selangor	...	...	...	...	68
Kedah	...	...	...	...	70

The total number of beds is 806. Of these eighty are hospital beds.

The daily average number present was 706.34 as compared with 700.46 in 1926.

There were 37 voluntary admissions.

Of the 164 admitted 22 were advanced cases.

(b) Of five hundred and six cases, who accepted treatment on modern lines, sixty-nine per cent. (three hundred and forty-nine cases) were of the advanced type.

A full report on treatment is forwarded by the Deputy Medical Officer—Appendix B.

STATISTICS OF TREATMENT BY MODERN LINES.

Years		Lepers present	Under treatment	Apparently cured during 1927	Definitely improved in 1927
1921	...	655	133	1	16
1922	...	699	357	1	19
1923	...	688	456	2	21
1924	...	726	528	1	33
1925	...	831	636	3	40
1926	...	850	681	7	106
1927	...	* 871	* 506	10	136

* Including those carried forward from previous years

(c) The following figures show the result of treatment on the death-rate.

				<i>Number of deaths</i>	<i>Percentage of deaths to total treated</i>
1923	Remained	498	688	140	20.34%
	Admitted	190			
1924	Remained	539	726	130	17.90%
	Admitted	187			
1925	Remained	584	831	117	14%
	Admitted	247			
1926	Remained	703	850	117	13.76%
	Admitted	117			
1927	Remained	707	871	122	14%
	Admitted	164			

(d) Anti-malarial work has been carried out regularly; there have been no fresh cases of malaria. Further sub-soil pipes were laid down at Camp *E*. One thousand two hundred and seventy-two gallons of oil were used for anti-malarial purposes.

(e) The total rainfall was 2,227 m.m. The maximum fall on one day was 74 m.m. on 5th September, 1927.

(f) Owing to the drought the water supply was deficient and 1,952 tons of fresh water was brought from Penang by water boat.

The Reservoir at Camp *E*. was completed in March. The whole of the inner basin was concreted, giving a depth of 30 feet, and a capacity of 750,000 gallons. The highest level of water was 30 feet.

(g) *Buildings*.—Extensive structural alterations were carried out to wards 1, 2, 3, 4, 5 and 6 at the Old Settlement Camp. These wards which were formerly dark and gloomy have had their lighting and ventilating conditions greatly improved. Four feet pavements were also built to the back of the wards. Wards 12 and 14 at the same camp have had 5 feet verandahs built on to their sides. All cooking is now done in these verandahs.

Ward 12 was converted into a ward for Mchamedans who are now living quite apart from the Chinese and Tamils. A bandarsah (religious place) was also erected at this ward.

Ward 13—the hospital at the Old Camp was extended to hold 20 more beds, making a total of 40 beds to this ward.

(h) Four brick incinerators were erected and these have helped to improve the sanitary state of the Settlement greatly.

(i) *Camp E*.—Extensive filling in has been done here.

(j) The piggery continues to be successfully worked by the inmates. A larger piggery was built at the Magazine Camp and all the pigs, 23 in number, have been shifted here.

(k) The Boy Scout patrol now consists of 16 boys. Their general health has greatly improved through drills and exercises.

(l) Tuition has been regularly given to 20 boys in Chinese and English.

(m) The Hills adjoining the camps at the new Station have been cleared and extensive vegetable gardens have been successfully worked by the inmates.

(n) At Chinese New Year each inmate received the usual gift of twenty-five cents.

(o) Special attention was directed towards the improvement of sanitation of the wards and Settlement generally.

(p) Dr. A. H. WHEATLEY remained in charge of the Leper Settlement; the health of the staff was good throughout the year.

(q) Mr. LANGHAM CARTER of Norfolk, England, generously sent a donation of \$50 which was devoted to the purchase of Gramophone records for the inmates.

V. RURAL AREAS.

(a) Vital statistics for the Settlement are given for 1925, 1926 and 1927; the figures for Penang Island including the Municipality are also shown.

VITAL STATISTICS FOR PENANG SETTLEMENT FOR 1925, 1926 AND 1927

—	Year	Estimated population	Total Births	Birth-rate per mille	Total Deaths	Death-rate per mille	Total malarial deaths	Malarial death-rate per mille	Total deaths of infants under one year	Infantile death-rate per mille, Births
Penang Island (including Municipality)	1925	173,217	5,783	33.39	5,201	30.02	...	...	912	157.70
	1926	176,126	5,923	33.63	6,046	34.82	...	...	1,056	178.28
	1927	181,104	6,860	37.88	6,523	36.02	...	...	1,234	179.90
Penang Island Rural Areas*	1925	39,844	1,465	36.77	1,404	35.24	477	11.97	196	139.79
	1926	41,022	1,495	36.44	1,616	39.39	702	17.11	242	161.87
	1927	41,456	1,723	41.07	1,567†	37.79	630	15.19	267	154.96
Province Wellesley	1925	131,577	4,374	33.24	3,733	28.38	1,372	10.42	615	140.60
	1926	131,930	4,557	34.54	4,215	32.21	1,783	13.51	624	136.93
	1927	135,028	4,734	35.06	4,303	31.86	1,464	10.84	732	154.63
Dindings	1925	15,185	433	28.51	342	22.52	123	8.10	68	157.94
	1926	16,260	473	29.03	476	29.29	173	10.63	97	205.07
	1927	16,931	508	30.00	566	33.42	252	14.88	92	181.10
All Rural Areas of the Settlement	1925	186,606	6,272	33.61	5,181	29.37	1,972	10.56	879	140.15
	1926	189,212	6,525	34.48	6,342	33.51	2,657	14.04	963	147.58
	1927	193,415	6,965	36.01	6,436	33.27	2,346	12.12	1,091	156.64

* The figures for Pulau Jerejak Leper Settlement and Quarantine Station not included with these.

† Fifty-five of these deaths occurred in the Government Hospitals within town limits.

(b) There was no occurrence of a dangerous infectious disease within the Rural Areas of the Settlement.

(c) The following shows the total number of vaccinations performed including those carried at the Quarantine Station.

VACCINATIONS IN PENANG SETTLEMENT DURING 1927.

Place	Number of Vaccinations performed	Percentage of successful results seen	Numbers not seen
Penang Island	9,605	96.88	299
Province Wellesley	4,091	94.66	381
Dindings	546	84.64	240
Quarantine Station, Pulau Jerejak ...	83,675	71.79	28,160
Total ...	97,917	74.72	29,080

(d) A separate report has been put in regarding the treatment of Yaws. The total number of injections given by the Dressers in charge of Balik Pulau Dispensary and the Government Travelling Dispensary in Penang Island during 1927 was 1,433.

(e) At the Penang Hills Dispensary, which is in charge of the Health Branch, the number of persons treated was 1,760 with total attendances amounting to 6,723.

(f) In all districts a considerable advance in sanitation was made.

(g) School work and anti-mosquito work carried out in the Rural Areas are both dealt with separately.

(h) *Tanjong Tokong Health Centre*—The work has been successfully organised by Miss E. W. DARVILLE, Health Sister in charge, and it is being very much appreciated by the public.

ATTENDANCES.

	<i>Fresh attendances</i>	<i>Re-visits</i>	<i>Total</i>
1. Ante-natal	28	49	77
2. Post-natal	148	190	338
3. Infants	119	195	314
4. Pre-school	193	305	498
Total for maternity and child welfare ...	488	739	1,227
Other cases advised and treated	532	449	981
Hook-worm cases treated	302	—	302
Total attendances			2,510
Talks to mothers ...	76		

VISITS TO HOMES.

			<i>Fresh attendances</i>	<i>Re-visits</i>	<i>Total</i>
			—	—	—
1.	Ante-natal	... ..	47	20	67
2.	Post natal	... ..	—	—	457
3.	Infants under 1 year	... ..	198	287	485
4.	Pre-school	... ..	470	400	870
			—	—	—
	Total visits for maternity and child welfare	... ..	715	707	1,879
			—	—	—
	Skin Diseases	... ..	...	185	
	Infectious Diseases	... ..	...	12	
	Hook-worm Diseases	... ..	..	261	
	Malaria	... ..	...	51	
	Tuberculosis—children	... ..	...	17	
	Tuberculosis—adults	... ..	...	18	
	Miscellaneous	... ..	...	469	
	Midwives	... ..	...	10	
	Schools	... ..	..	10	
	Coffee-shops	... ..	...	12	
	Leper Hospital	... ..	..	1	
				—	
				2,925	

Talks to mothers—80.

GOVERNMENT TRAVELLING DISPENSARY, PENANG.

ATTENDANCES.

			<i>Fresh</i>	<i>Re-visits</i>	<i>Total</i>
			—	—	—
1.	Under one year	... ..	49	160	209
2.	Pre-school	... ..	733	1,363	2,096
3.	School children	... ..	1,321	3,928	5,249
4.	Mothers	... ..	1,085	2,050	3,135
5.	Fathers	... ..	3,507	5,073	8,580
			—	—	—
	Total	... ..	6,695	12,574	19,269

SICK TREATED.

Women	... ..	1,085	
Men	... ..	3,507	
Children	... ..	2,103	Total 6,695
Mileage	... ..		3,428 miles
Cases taken to Hospital	...	2	
Number of injections given for Yaws and Syphilis—283.			

HEALTH PROPAGANDA WORK.

At the agricultural exhibition held at Balik Pulau in April a Health Section was organised in conjunction with the Straits Settlements Rural Sanitation Campaign and exhibits were shown. The staff of the Health Department assisted in giving explanations and demonstrations to the Public. One hundred and sixty sets of poster placards or 17 pictures illustrative of the various phases of hook-worm infection were printed for distribution to the schools in the Northern Settlement.

Talks to patients and their friends on health subjects are one of the regular features of the work done at Tanjong Tokong Health Centre.

Talks to Vernacular School boys on Hook-worm and malaria infections are regularly given by the Deputy Health Officer on his visits to the Schools.

VII.—SUMMARY OF ANTI-MOSQUITO WORK CARRIED OUT IN 1927

A.—PENANG.

(a) The staff employed on Anti-mosquito and Anti-malaria measures was as follows:—

1. Chief Sanitary Inspector. (Mr. J. S. DE VILLIERS.)
1. Mosquito Inspector.
2. Larvæ Searchers.
6. Overseers.
4. Masons.
3. Mandores (foremen).
88. Coolies.

(b) Permanent work was carried out by the Health Department in different parts of the Island. 119.82 chains of buried drain were laid or replaced and 35.50 chains of open masonry drain constructed at a total cost of \$6,986.82. The Sanitary Inspectors supervised the work carried out in their districts.

(c) The Mosquito Inspector and two collectors carried out fortnightly surveys all over the Island and on Pulau Jerejak. A complete list of larvæ collected and identified may be seen in Appendix A.

(d) The permanent work carried out during this year is summarised below.

Place	in chains Open drains	Buried drains in chains	Total cost
			\$ c.
Tanjong Tokong ...	20.	20.	2,578 20
Marine Dépôt ...	2.	34.50	1,384 43
Hill Station ...	5.50	5.	998 90
Aier Etam ...	—	17.	1,093 10
Waterfall Garden...	8.	13.82	805 40
Pulau Jerejak ...	—	29.50	126 69
Totals ...	35.50	119.82	6,986 82

(e) Temporary anti-mosquito work including oiling and ditching were carried out at Aier Etam, Tanjong Tokong, Teluk Bahang, Balik Pulau, Sungei Rusa, Sungei Pinang, Sungei Nibong, Bayan Lepas, Teluk Kumbar, Station and Pulau Jerejak. 69,416 gallons of oil were used at an approximate cost of \$33,472.98 including transport and labour. At Pulau Jerejak 2,036 gallons of oil were used and the total amount spent on temporary anti-malarial work was \$1,152.82.

(f) The Municipality continue to carry out their programme of Anti-malarial work at Batu Ferringhi and Teluk Tikus. The yearly returns show three deaths among an average labour force of 1,125 and 162 admissions to Hospital on account of all sickness.

(g) The following table shows the deaths reported at the various Rural Police Stations (not including Pulau Jerejak.)

Place	1926		1927	
	Total deaths	Deaths due to fever and malaria	Total deaths	Deaths due to fever and malaria
Aier Etam ...	95	32	113	63
Jelutong ...	33	15	35	16
Sungei Nibong ...	88	41	103	33*
Relau ...	94	43	93	32*
Bayan Lepas ...	151	73	169	66*
Teluk Kumbar ...	201	91	168	63*
Balik Pulau ...	294	142	283	104*
Pulau Betong ...	108	54	110	40*
Sungei Pinang ...	207	87	183	89*
Teluk Bahang ...	58	23	46	18*
Batu Ferringhi ...	52	23	48	28
Tanjong Tokong ...	123	42	156	61
Bukit Penara ...	12	8	5	4*
Town Hospital ...	100	27	55	13*
TOTALS ...	1,616	702	1,567	630

*Decrease.

(h) Special mosquito surveys were made of the following places by the Mosquito Inspector:—Teluk Kumbar, Bayan Lepas, Balik Pulau, Sungei Pinang, Pulau Betong, Sungei Glugor, Relau and Sungei Nibong.

(i) Visits were made to Pulau Jerejak and surveys were also carried out in Province Wellesley at Bukit Tambun, Sungei Bakap, Butterworth, Lumut and Segari.

B.—PROVINCE WELLESLEY.

(a) At Butterworth along Pantei Road—43 chains of concrete drain were constructed by the P. W. D. Some old and unnecessary drains were filled with roadside refuse and covered with 40 cubic yards of sand at a total cost of \$6,000.

(b) A small patch of reserve road and some low ground in lot 306 at Bagan Tuan Kechil have now both been raised and filled in with 2,400 cubic yards of sand at a total cost of \$3,840.

(c) Permanent work was carried out at Bukit Tambun. Fifteen chains of buried drain were laid at a total cost of \$452.03.

(d) Temporary anti-malarial measures were carried out in the following places:—Butterworth, Penaga Wireless Station, Bukit Tambun, Nibong Tebal and Simpang Ampat. 10,020 gallons of oil were used and the total cost, including transport was \$8,604.57.

(e) Tables showing the comparative rates of malaria incidence as regards deaths and also admissions into Hospital during the year 1926 and 1927 respectively in Province Wellesley South are given below.

TABLE I.

Village under Anti-Mosquito Control	Deaths from Malaria	
	1926	1927
Sungei Bakap	24	7
Nibong Tebal	35	25
Bukit Tambun	18	7
Simpang Ampat	13	5

TABLE II.

Village	Admissions to Sungei Bakap Hospital			
	1926		1927	
	Admission.	Deaths	Admission.	Deaths
Sungei Bakap	139	14	29	0
Nibong Tebal	84	10	62	6
Bukit Tambun	30	1	17	2
Simpang Ampat	28	3	26	1

C.—LUMUT.

(a) *Staff*:—One Mosquito Inspector.

One Oiling Overseer.

42 Coolies.

(b) The whole of ravine No. 1 was permanently drained. Twenty-four chains of buried drain were laid and 18 chains of open concrete drain constructed at a total cost of \$13,461.89. The work was carried out by the Assistant Engineer, Dindings.

(c) Maintenance of completed Anti-malarial work was undertaken by the Sanitary Inspector and the Mosquito Inspector.

Grass in ravines 2 to 9 was regularly cut and in addition 26 chains of buried drain were laid or relaid and 16 chains of open concrete drain constructed.

(d) Oiling was regularly carried out at Lumut and Segari. 3,671 $\frac{1}{4}$ gallons of oil were used and the total cost of this was \$4,453.89.

(e) At Sandycroft the culverts near the 29th mile were widened at a total expenditure of \$1,037.

(f) The two reservoirs continue to be a danger whether full or empty. *A. maculatus*, *A. karwari* and *A. aitkeni* were discovered in both of them. The sides were regularly cleaned.

(g) Mosquito Surveys were regularly carried out by the Mosquito Inspector at Lumut, Segari, Damar Laut and Pangkor.

(h) A record of larvæ discovered may be seen on Appendix B.

D.

Fifty-two notices under the Destruction of Mosquito Ordinance No. 174 were issued during the year.

E.

The total amount spent on Anti-malarial work in the Northern Settlement during the year was \$105,893 and 78 cents.

A statement of expenditure incurred is shown in Appendix C.

VIII. ESTATE WORK

- (a) The number of visits made to estates by officers of the Health Branch totalled 213.
- (b) Vital statistics for the estates for which figures are available are given below. Analysis of this table shows the high proportion of deaths among dependents and the excessive number of deaths which occur outside any hospital.

VITAL STATISTICS OF ESTATES IN NORTHERN SETTLEMENT FOR WHICH FIGURES ARE AVAILABLE

SITUATION	Total of Estates	Total Acreage	POPULATION			BIRTHS		DEATHS						Grand Total	Death-rate per mille	Death-rate among La-bourers only	TOTAL *		
			Labour-ers	Dependents	Total	In Hospital	In Lines	Birth-rate per mille	In Hospital			Outside Hospital							
									Labours	Dependents	Total	Labours	Dependents					Total	
I	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Penang	29	15,630	753	63	87	903	...	1	1'10	1	...	1	5	...	5	6	8'85	6'64	2
Province Wellesley North & Central ...	21	22,000	6,824	484	1,876	9,184	5	253	28'09	43	33	76	30	111	141	217	23'62	10'69	64
Province Wellesley South	62	35,640	7,136	685	2,076	9,897	41	206	24'95	38	65	103	7	59	66	169	17'07	6'30	78
Dindings	24	17,854	2,279	64	908	3,251	27	43	24'60	43	50	93	9	25	34	127	10'45	22'80	33
Summary	136	91,124	16,992	1,296	4,947	23,235	73	503	26'72	125	148	273	51	195	246	519	22'33	10'35	177

* Also included in column 17

- (c) A list of orders issued on Estates is also given; although a number of orders were not satisfactorily completed by the end of the year in every case action is being taken.
- (d) Summary of the admissions and death-rates for Estate Hospitals in Province Wellesley is shown below.

Total of six Estate Hospitals	Number of admission	Number of deaths	Death-rate per admission to Estate Hospital
	3,818	158	41'38

LIST OF TABLES.

1. Leper Settlement, Pulau Jerejak—Table showing admissions, deaths and the daily average for 1927.
2. Leper Settlement, Pulau Jerejak —Table showing the nationalities of inmates for 1927.
3. Leper Settlement, Pulau Jerejak—Table showing the occupation of inmates 1927.

LEPER SETTLEMENT, PULAU JEREJAK

I. Table showing the number of admissions, total number of deaths, total number of inmates and the daily average for 1927.

Year	Remained from Previous year	Colonial	Perak	Selangor	Kedah	Total	Deaths	Percentage of deaths to total treated	Daily average
1927 ...	707	145	...	...	19	871	122	14.00%	706.34

II. Table showing the Nationalities of inmates for 1927.

Nationalities			Colonial	Perak	Kedah	Selangor	Total
Bengali Island	...	...	3	—	—	—	3
Bugis	...	...	1	—	—	—	1
Cantonese	...	...	136	70	9	—	215
Eurasian	...	...	10	1	—	—	11
Filipino	...	...	1	—	—	—	1
Fuichew	...	...	1	1	—	—	2
Hockchew	...	...	6	1	—	—	7
Hokkien	...	...	110	20	14	5	149
Hooichew	...	...	7	—	—	—	7
Howchew	...	...	1	—	—	—	1
Hylam	...	...	42	2	7	3	54
Hylockhong	...	...	3	—	—	—	3
Indian Islam	...	...	6	—	1	—	7
Javanese	...	...	2	1	—	—	3
Kheh	...	...	59	38	7	30	134
Looi Chew	...	...	2	—	—	—	2
Maccow	...	...	21	1	14	31	67
Malay	...	...	8	—	—	—	8
Shanghainese	...	...	1	—	—	—	1
Siamese	...	...	—	—	1	—	1
Tamil	...	...	58	23	21	6	108
Telegu	...	...	—	—	1	—	1
Teochew	...	...	68	4	12	1	85
Total ...			546	162	87	76	871

III. Table showing the occupation of inmates for 1927.

Occupation	Colonial	Perak	Kedah	Selangor	Total
Barber ...	7	1	—	1	9
Blacksmith ...	7	1	—	—	8
Boatman ...	6	—	—	—	6
Cart driver ...	2	1	2	—	5
Carpenter ...	27	7	2	6	42
Cake seller ...	2	—	—	1	3
Chickmaker ...	1	—	—	—	1
Chinese Clerk ...	6	—	—	—	6
Chinese Physician ...	1	—	—	—	1
Chinese Teacher ...	—	—	—	1	1
Cigar Seller ...	—	1	—	—	1
Cobbler ...	—	1	—	—	1
Changkol Coolie ...	—	—	10	1	11
Conductor ...	2	—	—	—	2
Contractor ...	1	—	—	—	1
Basket Maker ...	2	—	—	—	2
Coolie ...	209	40	36	15	300
Dhoby ...	9	2	—	—	11
Dresser ...	1	—	—	—	1
Cook ...	8	1	2	1	12
Engine cleaner ...	—	1	—	—	1
Fowl seller ...	1	—	1	—	2
Fruit seller ...	1	—	—	—	1
Fitter ...	3	—	—	1	4
Fisherman ...	5	—	—	—	5
Gardener ...	19	8	6	—	33
Glass cutter ...	—	1	—	—	3
Grass cutter ...	—	—	2	—	2
Gate keeper ...	1	—	—	—	1
Grave digger ...	1	—	—	—	1
Goldsmith ...	—	—	1	1	2
Hawker ...	27	9	1	2	39
Handcart puller ...	7	—	—	—	7
Hospital attendant ...	1	—	—	—	1
Mason ...	6	2	—	4	12
Mining Coolie ...	4	46	—	22	72
Money changer ...	1	—	—	—	1
Motor car driver ...	5	—	1	1	7
Musician ...	1	—	—	—	1
Nil ...	51	7	7	—	65
Paddy planter ...	1	1	1	1	4
Planter ...	6	—	3	—	9
Pork Seller ...	1	—	—	—	1
Pressman ...	1	—	—	—	1
Rickshaw puller ...	4	—	—	1	5
Rubber tapper ...	53	17	2	8	80
Scavenger ...	—	1	4	—	5
School boy ...	10	2	—	—	12
Shoemaker ...	2	—	1	—	3
Sailor ...	5	—	—	—	5
Shop keeper ...	9	—	1	—	10
Stone breaker ...	2	—	—	—	2
Tindal ...	—	1	—	—	1
Tailor ...	7	—	—	—	7
Vegetable planter ...	9	1	2	4	16
„ seller ...	1	—	—	—	1
Watchman ...	—	1	—	—	1
Weaver ...	—	—	1	—	1
White washer ...	1	—	—	—	1
Wood cutter ...	9	9	5	—	26
Total ...	546	162	91	71	871

APPENDIX A

	PENANG ISLAND			PULAU JEREJAK		PROVINCE WELLESLEY			TOTAL
	North-East	South-West	Hill Station	Leper Hospital	Quarantine Station	Sungei Bakap	Bukit Tambun	Yarak Estate	
Breeding places described ...	397	170	12	21	34	10	12	14	670
Larvae identified microscopically ...	2,716	1,325	7	97	84	48	46	53	4,376
Adults bred out and identified ...	274	97	10	8	14	1	6	10	420
									60

Species

Approximate ratio per cent

A. maculatus	...	...	...	...	...	60	46	...
A. karwari	...	...	...	...	...	2	11	...
A. kochi	...	...	...	...	...	12	47	...
A. vagus	...	...	...	...	...	11	76	...
A. barbirostris	...	...	...	...	...	4	87	...
A. sinensis	...	...	...	...	...	1	49	...
A. leucosphyrus	...	...	...	...	...	6	99	...

APPENDIX B

	RAVINES					Feeder to old Reservoir	RAVINE		Feeder to new Reservoir	No. 8	Ravine No. 9	No. 10	Quarry	L.K.V. garden	Propose site to New Reservoir	Pangkajene Ice Factory	Govt. Quarry	Segari Village	Segari Estate	Ravine A. Kg. Batu Gajah Rd.	3rd Mile Pundut
	No. 1	No. 2	No. 3	No. 4	No. 5		No. 6	No. 7													
Breeding places described ...	4	...	...	...	269	119	...	183	103	1	...	2	...	...	18	7	12	44	8	16	44
Larvæ identified microscopically	16	...	...	...	1,152	830	...	682	625	4	...	15	...	...	41	20	54	242	34	123	287
Adults bred out and identified ...	...	...	...	...	19	21	...	12	8	...	...	...	...	...	5	...	...	...	...	...	...

Species	Approximate ratio per cent		Species	Approximate ratio per cent	
	—	—		—	—
A. maculatus	A. barbirostris	...	...
A. karwari	A. kochi	...	...
A. tessellatus	A. aitkeni	...	...
A. umbrosus	A. leucosphyrus	...	...

APPENDIX C

Where Incurred	ORDINARY				EXTRA—ORDINARY			
	Salaries	Coolies Wages	Transport	Oil	Instruments equipments	Drainage and materials and labour	Miscellaneous	Total expenditure
Penang ...	\$ 5,924 32	\$ 20,799 10	\$ 5,457 18	\$ 24,091 00	\$ 801 70	\$ 3,140 97	\$ 4,719 96	\$ 64,934 23
Province Wellesley	—	5,689 93	406 30	3,053 84	—	4,015 00	384 50	13,549 57
Dindings ...	—	3,664 67	1,257 64	1,752 00	—	774 10	534 94	7,983 35
Crown Agents ...	—	—	—	—	—	—	—	800 35
Totals (a) ...	5,924 32	30,153 70	7,121 12	28,896 84	801 70	7,930 07	5,639 40	87,267 50
Ravine No. 1 Lumut (16,000.00) ...	—	574 10	333 84	—	—	15,008 29	708 05	16,624 28
P e n a g a Wireless Station ...	—	—	—	—	—	—	965 00	965 00
Sandycroft Estate	—	483 00	97 00	—	—	365 00	92 00	1,037 00
Totals (b) ...	—	1,057 10	430 84	—	—	15,373 29	1,765 05	18,626 28
Totals (a) and (b)	5,924 32	31,210 80	7,551 96	28,896 84	801 70	23,303 36	7,404 45	105,893 78

MALACCA.

BY S. W. EVESON, M.R.C.S., L.R.C.P.

*Health Officer, Malacca*1. *Staff.*—

- One full time Health Officer.
- Two part time Assistant Health Officers.
- Seven Sanitary Inspectors.
- Two Health Dressers.
- Two Health Nurses.

2 The Rural Area consists of an area of 716.5 square miles and is divided for the purpose of administration into Districts.

- 1. North Central District.
- 2. South central.
- 3. Jasin.
- 4. Asahan.
- 5. Merlimau.
- 6. Alor Gajah.
- 7. Masjid Tanah.

A Sanitary Inspector is in charge of each District

3. The statistics for the whole Settlement including the Municipality for 1923–1927, inclusive:—

<i>Year</i>	<i>Estimated Population</i>	<i>Death</i>	<i>Death-rate</i>	<i>Birth</i>	<i>Birth-rate</i>	<i>Infantile Mortality</i>
1923	160,886	4,341	26.93	5,461	33.95	258.70
1924	170,294	4,299	25.24	5,834	34.26	253.34
1925	177,010	4,046	22.85	5,798	32.76	226.46
1926	184,437	5,606	30.40	6,640	36.00	268.22
1927	188,828	6,582	34.86	7,403	39.20	291.64

Both the death-rate and infantile mortality rate show an increase.

Deaths from Malaria, Convulsion, Fever unspecified taken together give nearly two-third of the total number of deaths.

Deaths returned as fever unspecified show a marked decrease, proving more accurate diagnosis.

Taking into consideration the fact that deaths from Malaria and Convulsions appear to rise and fall at practically identically the same period of the year, I am of opinion that the majority of deaths from Convulsions are most probably due to Malaria.

<i>Year</i>	<i>Malaria</i>	<i>Convulsion</i>	<i>Fever Unspecified</i>	<i>Total</i>
1926	1,723	1,442	285	3,450
1927	2,197	1,674	189	4,060

No cases of Cholera, Plague or Cerebro Spinal Meningitis occurred in 1927.

Small-pox.—Ninety-eight cases of small-pox occurred in 1927 with 19 deaths. Practically all cases were discovered near the coast road, Sungei Rambei—Kuala Linggi, and it is quite possible that they came from South Johore and Singapore.

Leprosy.—Twelve cases were dealt with during 1927.

Eleven cases were sent to Asylum.

One case was isolated in his own house and died.

Erysipelas.—There was one case of Erysipelas in 1927 but not fatal.

Chicken-pox.—Twenty-nine cases of chicken-pox occurred in 1927 with no deaths.

Diphtheria.—Four cases occurred in 1927 with three deaths.

Enteric Fever.—There was one case of Enteric Fever but not fatal. The source of infection was unknown.

General Sanitation.—

I. Anti-mosquito Work is shown in Appendix "A".

II. The Rural Sanitation and Hookworm Campaign including latrine construction is shown in Appendix "B".

III. *Gazetted Villages*.—

One collection of shop houses known as Sempang Ampat was *gazetted* during the year. Conservancy was attended to in two villages—Sungei Udang and Masjid Tanah.

A new market was built in Pulau Sebang.

A public latrine was built in Jasin. Ten new incinerators of a good type were put up in various villages.

IV. *Kampongs*.—Kampongs generally showed improved sanitation during the year and many kampong householders put up a good type of pit latrine.

Estates.—One hundred and nine visits were paid to European, Chetty and Chinese Estates. Ten orders for improvements were issued by the Controller of Labour. Seven orders were made by the Health Officer on the recommendation of the Malacca Agricultural Medical Board.

V. The Malacca Agricultural Medical Board obtained the services of one Mosquito Inspector on the recommendation of the Health Officer.

VI. *Government Buildings*.—As a result of the Sanitary Survey of Government buildings in 1926 all Schools and P. W. D. coolie lines were sanitated from the conservancy standpoint as far as possible in 1927. A vote was made by the Rural Board of \$2,000 for cleaning up coolie lines with a view to decreasing the incidence of Malaria among the coolies.

6. *Infant Welfare*.—Two thousand nine hundred and forty-six visits were made in the Southern and Northern Districts by Health Nurses. The second baby show in Malacca was held on 16th July. Nearly 100 babies were exhibited including seven Malays.

7. *Schools*.—All the Schools were visited during the year and pupils were treated according to their ailments.

Yews	...	...	...	...	194
Malaria	...	...	...	...	38
Scabies	...	...	...	...	96

Latrine requirements for all the Vernacular Schools in Malacca, were completed during the year.

8. *Dairies*.—There are seven dairies in the Rural area which supply milk to the Town. Samples of milk were examined with the following results:—

Analysis	...	...	..	...	16
Prosecutions	...	...	...	...	2

APPENDIX "A"

Progress Report of Anti-mosquito Works, Malacca, for the year 1927.

CENTRAL.—

(a) *Limbongan*.—

Total length of drains cut—3,880 feet.

Total length of old drains closed—450 feet.

Oiling carried out regularly and work carried on periodically for upkeep of drainage.

(b) Lurian Daun Hospital.—

Total length of drains cut—1,550 feet.

Total length of old drains closed—50 feet.

Oiling carried out regularly and work carried on periodically for upkeep of drainage. Total area of clearing undergrowths, etc.—1,050 × 250 feet.

(c) Perringit.—

Total length of drains cut—3,500 feet.

Total area of filling and levelling—750 × 550 feet.

Total area of clearing undergrowth, etc.—3,050 × 305 feet.

Oiling carried out regularly and work carried on periodically for upkeep of drainage.

(d) Police Dépôt.—

Total length of drains cut—2,110 feet.

Total area of filling and levelling—700 × 550 feet.

Four cesspools have been covered—6 × 6 feet each.

One old drain has been closed—200 feet long.

Nine hundred and ten subsoil pipes have been laid in the football field and near the barracks.

Oiling carried out regularly.

(e) Tanjong Kling.—

Total length of drains cut—2,400 feet.

Total area of filling and levelling—900 × 190 feet.

Total area of clearing undergrowths, etc.—900 × 170 feet and one old drain closed 400 feet.

(2) JASIN.—

Total length of drains cut—4,991 feet.

Total length of old drains closed—920 feet.

Total area of filling and levelling—2,319 × 518 feet.

Total area of clearing undergrowths, etc.—3,612 × 1,021 feet.

Two thousand and sixty subsoil pipes have been laid in the football field and at the hill foot near old Jasin Hospital.

Oiling carried out regularly and work carried on periodically for upkeep of drainage.

*(3) ALOR GAJAH.—**(a) Hospital.—*

Total length of drains cut—1,621 feet.

Total area of clearing undergrowths, etc.—3,960 × 396 feet.

Eight hundred subsoil pipes have been laid.

Oiling carried out regularly and work carried on periodically.

(b) Ayer Panas.—

Total length of drains cut—2,230 feet.

Total area of clearing undergrowths, etc.—1,796 × 32 feet.

Oiling carried out regularly and work carried on periodically for upkeep of drainage.

(c) Ong Hin Tiang Estate.—

Total length of drains cut—5,800 feet.

Total area of clearing undergrowths, etc.—4,604 × 722 feet.

Deepening streams—2,625 feet long.

(d) Durian Tunggal.—

Total length of drains cut—6,606 feet.

Area of filling and levelling— 495×230 feet.

Total area of clearing undergrowths, etc.— 195×25 feet.

One thousand two hundred and fifty subsoil pipes have been laid.

APPENDIX "B"

RURAL CONSERVANCY

Latrine Construction.—Two hundred and sixty-one latrines for Government buildings including 255 pit latrines and six bucket latrines.

Four demonstration latrines by Health Department including two pits and two buckets.

One hundred and twenty-nine latrines put up by Health Department and sold including 51 pits and 80 buckets.

Eight hundred built by Kampong (village) Malays.

Total 1,194 for 1927.

The list excludes estate conservancy.

In the Northern District—five schools were visited by the District Health Officer. Three hundred and fifty-eight pupils were examined and treated for Hookworm.

In the Southern District—13 schools were visited by the District Health Officer. Nine hundred and thirteen pupils were examined and treated for Hookworm.

In this District 800 kampong (village) house holders built satisfactory latrines.

ANTI-MALARIAL WORKS, LABUAN.

REPORTED BY DR. H. W. FURNIVALL, M.B., B.S.,
Medical and Health Officer, Labuan.

The total amount of money approved for anti-malarial work in Labuan was \$7,000, out of which \$3,854.34 was spent on the construction of coolie lines and the balance was spent on anti-malarial work.

Mosquito surveys were made first by Dr. SCHARFF who recommended oiling for an area of about one square mile from the Government Offices. This was sub-divided into small sections and oiling was done regularly and systematically.

Mosquito re-surveys were made from time to time within the oiling areas with the assistance of the Sanitary Inspector and preventive steps taken.

Kampong Parit three, which was noted for Malaria sometime back, has greatly improved, and several new houses have been built there.

Out of the 17 children under 12 years of age examined there for Spleen, only one had a slightly enlarged spleen.

A portion of the land that was found to breed *A. ludlowi* behind the Government Offices was filled and levelled.

Oil spraying.—Oiling was done in the areas mapped out and 120.2/5 gallons were used per week.

Maintenance work was done as required along the oiling ravines and many surface drains cut on private and Crown lands, and certain road-side ditches were graded and kept up, thus supplementing the work usually performed by the Public Works Department.

Labour.—A small gang at first of Kedayans and later on of Singapore Tamils has been maintained, but the latter were very unsettled and constantly changing.

A Mosquito Survey by Dr. J. W. SCHARFF, revealed the following anopheline in the places stated.

A. ludlowi	...	In tidal pools off McArthur Road, " " " " North Road, " " " " Plain Road, " " " " Treacher Road, At the junction of Plain Road and Callaghan Road.
A. karwari	...	In seepages from ravines in front of Residency. In Reservoir.
A. umbrosus	...	In the ravines at the back of the Residency. In shady pools between McArthur Road and North Road.
A. vagus	...	In muddy pools off Plain Road
A. separatus	...	In pools not influenced by tide.

Sanitation.—The work of scavenging, collection of refuse and the cleaning of the very few and shallow cement drains of the Town proper was done by a Chinese contractor who had two coolies to help him. One of these had been suffering for the most part of the year from tertiary syphilis.

The collected refuse was taken to a coconut plantation at the junction of North Road and Plain Road to fill up the pits and burrows which are subject to tide. Periodical visits were made by the Sanitary Inspector and myself to note any insanitary conditions and correct them.

The supervision of the refuse contractor was mostly done by the Rural Board Overseer, and occasionally by the Health Department Sanitary Inspector.

Sanitary dust-bins are being introduced in the Town. Trade is gently increasing and so does the trade refuse which necessitates the construction of an incinerator, at an early date.

In the first part of September, 1927, sanitary collection, removal and disposal were started and since then 88 latrines of a portable type have been built and many more are being installed.

The night soil collection was done by a Chinese contractor under the supervision of the Sanitary Inspector and assistance was rendered by the Rural Board Overseer.

The night soil thus collected is dumped into the sea from a pier built for that purpose, between the hours of 5-30 A.M. and 9 A.M. and no nuisance has arisen from it.

During the year 1,073 house to house inspections were made by the Sanitary Inspector and detailed reports were made on 173 houses. Five hundred and twenty-eight visits were made to Eating and Coffee shops, 4 to Slaughter houses, 6 to Bake houses, 18 to Dairies and Milkvendors, 41 to cow-sheds, 96 to Piggeries and 15 to Factories and Godowns.

General.—The year 1927 marked a decided step forward in the detailed attention given to sanitation in and about the Port of Victoria, Labuan, and an area of $\frac{3}{4}$ square mile adjacent. This was rendered possible by the provision of a 1st grade Sanitary Inspector.

Progress implied much additional expenditure and provision annually of \$7,000 under a Health vote.

A considerable part of the new provision has gone to the erection of coolie lines for a permanent gang, but henceforth the whole will be available for Anti-Malarial work.

SCHOOL HYGIENE.

There are in the Colony about 55,000 children of school age. The medical and health control of the schools is vested in the Government Health Branch.

In Singapore the Assistant Health Officer examined 7,078 boys as against 5,338 in 1926. The Lady Health Officer examined 2,935.

In Penang Settlement (including Province Wellesley and the Dindings) 8,480 boys and girls were examined.

In Malacca 6,820 boys were examined.

The cleanliness and general nutrition of the children have greatly improved.

Dental defects in the town show no signs of diminishing but more children are being sent to the dentists. Details of School Hygiene are given in Appendix K.

HOUSING AND TOWN PLANNING

The working out of Improvement Schemes in the Municipalities of Singapore, Penang and Malacca, continues to advance and more land is being acquired and laid out.

A sum of ten million dollars has been appropriated by Government for the Scheme in Singapore.

An ordinance to provide for the improvement of the Town and Island of Singapore has become law, and the Municipalities have already started to open up more land to remedy the overcrowding in the Municipal area.

MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

A health exhibition was held in connection with the agricultural exhibition in Balik Pulau. It included sections on hookworm and other intestinal infection, malaria, infant welfare and maternal hygiene, tuberculosis, yaws and venereal diseases.

A health centre was opened in Tanjong Tokong in Penang, and a permanent health exhibit has been installed there. It is very much appreciated by the public.

Talks to patients and other friends on health subjects are regular features of the work done at Tanjong Tokong Health Centre.

Two health centres were opened in May in Singapore in the most populated of the rural areas. Clinics for infants, children and mothers are held in each of these districts regularly.

Baby shows were held during the year in both Singapore and Malacca; model layettes were shown and methods of feeding were demonstrated.

Dr. PAUL RUSSELL of the International Health Division of the Rockefeller Foundation has been most active throughout the year, in lecturing on and demonstrating the causes and prevention of Ankylostomiasis and other bowel diseases. Several pamphlets were issued and many cinema and lantern demonstrations were given.

TRAINING OF SANITARY PERSONNEL.

The sanitary inspector is to a Health Service what a sergeant is to the army, its backbone. On him depends the daily routing for carrying out health duties.

With the development of rural sanitary work, it became obvious in 1921 that the Government should have a proper staff of sanitary inspectors. A lecture-room, small museum and various offices and a store were fitted out at Jalan Klapa. The collaboration of the Royal Sanitary Institute of London

was fortunately obtained; and, in accordance with its practice in suitable tropical centres, the Institute agreed that students locally trained on an approved schedule should be able to obtain the Sanitary Inspector's Diploma of the London Institute after an examination by an approved Board of Examiners in co-operation with the Government of the Straits Settlements. This facility was much appreciated, for it meant that not only the comparatively few students destined for Government service would be catered for, but, at the same time, without much expenditure, members of the public might be admitted to the course on payment of the necessary fees. The school has throughout been under the charge of Dr. GILBERT BROOKE. The first session began in May, 1921, and was attended by five selected candidates for Government Service.

In 1922, 7 candidates attended the second session, of whom three were successful at its conclusion. In 1923, ten students attended the course, of whom three passed; in 1926, 26 students attended the course, the successful ones numbering eleven, and in 1927, 33 students attended the course, of whom 21 passed. A fifth training took place in 1925. The number of candidates amounted to the large total of 43, of whom 36 sat for the Royal Sanitary Institute Examination. Twelve candidates were successful in obtaining the diploma after the usual examination in Hygiene, Sanitary Engineering, Veterinary Science, Chemistry and Physics. This class proved too large for successful handling.

IV.—KING EDWARD VII COLLEGE OF MEDICINE, SINGAPORE.

The Patronage of the College.—On the departure of Sir LAURENCE NUNNS GUILLEMARD, K.C.B., K.C.M.G., from the Straits Settlements in June, 1927, Sir HUGH CLIFFORD, M.C.S., G.C.M.G., G.B.E., Governor and Commander-in-Chief of the Straits Settlements, and High Commissioner for the Malay States, honoured the College by consenting to be its Patron.

The Electoral Board. Messrs. TAN CHENG KEE and YOW NGAN PAN, though resigning from the Council, remained on the Electoral Board in their capacity as benefactors to the College.

Messrs. ONG HOOD HIN, TAN SOO JIN and WEE KAH KIAT were elected to the Electoral Board in recognition of donations to the College.

The Council.—The President, the Hon. Dr. A. L. HOOPS proceeded on leave on 24th November, 1927, and the Hon. Dr. J. GRAY acted in his place.

Dr. G. H. MACALISTER has been away on leave during 1927. His place as Secretary to Council and as Principal has been taken by Professor J. R. KAY-MOUAT during his absence.

Dr. A. R. WELLINGTON has been absent on leave. His place has been taken by Major A. K. COSGRAVE.

Dr. W. FLETCHER left the Colony in August, 1927. The Federated Malay States Government nominated the Hon. RAJA MUSA UDIN BIN SULTAN SULEIMAN SHAH, Raja Muda of Selangor in his place.

Sir DAVID GALLOWAY proceeded on leave in May, 1927. The Hon. Dr. NOEL CLARKE acted for him until September, 1927.

Mr. TAN SOO BIN was absent on leave until March, 1927.

Mr. GAW KHEK KHIAM, J.P., was elected to the Council in place of TAN CHENG KEE Esqr.

The Hon. RAJA CHULAN, C.M.G., J.P., Raja di Hilir Perak, was elected to the Council in place of YOW NGAN PAN Esqr.

Senate.—Dr. G. C. B. GILMOUR, M.B., B.Ch., was appointed Lecturer in Infectious Diseases.

Dr. A. J. COPELAND, M.A., M.B., B.Ch., B.Sc., M.R.C.S., L.R.C.P., was appointed Lecturer in Experimental Pharmacology.

Dr. J. W. SCHARFF, M.D., D.P.H., was appointed Lecturer in Field Sanitation and assumed duties in June, 1927.

Professor G. MACOWAN, D.Ph., M.A., B.Sc., F.I.C., of Raffles College, Singapore, was lent to the laboratories of Chemistry at the College of Medicine and instructed the students of the first year in Chemistry and assumed duties in June, 1927.

Professor E. MADGWICK, M.Sc., Ph.D., of Raffles College, Singapore, similarly officiated in Physics and assumed duties in June, 1927.

Dr. R. B. HAWES, M.B., M.R.C.P., was appointed Professor of Medicine and assumed duties on 23rd April, 1927.

Dr. J. S. WEBSTER, M.B., B.S., D.P.H., D.M.R.E., was appointed Lecturer in Radiology.

Dr. A. BARNSEY, M.R.C.S., L.R.C.P., was appointed Lecturer in Anæsthetics.

Professor A. N. KINGSBURY, M.B., B.S., D.P.H., D.T.M. and H., resigned the Professorship of Bacteriology to assume the Directorship of the Institute for Medical Research, Federated Malay States.

Professor W. A. YOUNG, B.Sc., M.B., B.S., D.T.M. and H. assumed duties in his place.

Mr. A. D. WRIGHT, M.S., F.R.C.S., was absent on leave from 19th November, 1926 to 24th March, 1927.

Professor J. L. ROSEDALE, Ph.D., D.Sc., F.I.C., assumed the duties of Professor of Bio-chemistry on 21st May, 1927. Professor ROSEDALE was absent on leave from 24th November, 1927 to 24th December, 1927 to attend the Far Eastern Association of Tropical Medicine Congress at Calcutta.

Dr. R. W. C. KELLY, M.R.C.S., L.R.C.P., went on leave on 31st May, 1927. His place was taken by Dr. W. M. CHAMBERS, M.D., M.R.C.S., L.R.C.P. and S., L.F.P. and S.

Dr. E. D. LINDOW, M.R.C.S., L.R.C.P., proceeded on leave on 2nd June, 1927. His place was taken by Dr. J. C. CARSON, M.B., Ch.B.

The lectures in Forensic Medicine had been transferred from Dr. E. R. STONE to Dr. J. C. TULL on the recommendation of Colonel NEEDHAM who considered that these lectures should be given by and in conjunction with the work of the officer doing the practical work in this subject.

The regulations of Senate after systematisation have been confirmed by Council.

Junior Teaching Staff.—Dr. B. J. Ess resigned with effect from 8th June, 1927.

Students.—The conditions of award of scholarships and exhibitions were revised so as to limit these awards to local candidates of merit and in case of exhibitions to those who required financial assistance.

Fourteen students passed the final examination for the Diploma of L. M. S. The total number of licentiates in December, 1927 was 212.

In December, 1927, 110 students were attending the College distributed thus:—

First year	...	...	...	...	36
Second and third years	...	...	...	...	38
Fourth year	...	...	..	...	10
Fifth year	...	....	...	...	16
Sixth year	...	...	...	...	10
				—	110
Of these there are:					
Straits Settlements Government Students	...			...	7
Federated Malay States Government Students	...			...	25
Kedah Students	...	...	...	...	2
Douglas Campbell Memorial Fund (Johore)					
Students	...	...	...	...	1
Council Scholars	...	..	...	...	31
Other students	...	...	...	...	44
				—	110

Buildings.—The workshop has been transferred to the end of the second animal house.

The lecture rooms opposite the lecture hall have been converted into a store room.

Recreation Grounds.—The football ground on the Kampong Bahru reclamation ground, four tennis courts near the College Road Hostel and three tennis courts at the Tan Tock Seng Hostel are now being used by the students.

A fund, instituted for a pavilion, now amounts to \$1,625.

Provision for the maintenance of the grounds has been made and a vote in aid has been approved by Government.

Curriculum.—Examinations. The examinations have been extended by the separation of Physiology, Bio-chemistry, Bacteriology and Pathology.

The appointment of reserve examiners has been approved.

The clinical appointments were extended, the work being arranged by the calendar months. Appointments are quarterly and one month's vacation is allowed in each of the final years.

Presentation of Prizes.—His Excellency, Sir HUGH CHARLES CLIFFORD, M.C.S., G.C.M.G., G.B.E., presented the medals and awards for the year on 7th September, 1927, and gave an address to the students in the Lecture Hall at the College of Medicine.

Public Lectures.—Dr. J. W. SCHARFF showed a film on anti-malarial work on 1st July, 1927.

Dr. WU LIEN TEH gave a lecture in "The Progress of Public Health in the World" on 7th November, 1927.

His Excellency, Sir HUGH CHARLES CLIFFORD, M.C.S., G.C.M.G., G.B.E., gave an introductory address at Dr. WU LIEN TEH's lecture.

V.—CHILD WELFARE AND MATERNITY WORK.

For the population of this Colony of whom a large population are uneducated in public health matters and are indifferently housed, child welfare work is of great importance. The annual infantile mortality rate is a delicate index to the health of the community.

The number of registered midwives at the end of the year was—Singapore 399, Penang 159 and Malacca 30, of whom a few were practising in rural areas.

In all 79,852 consultations were held on 9,172 babies by the Municipal sisters and health visitors in Singapore, inclusive of visits to their houses and visits of mothers with infants to clinics.

Ten thousand and twenty-nine infants were seen at first visits to homes. Of these 7,606 were breast-fed, 1,684 were taking tinned milk and 217 were on mixed feeding.

Of 9,981 mothers visited in Singapore, 8,037 were living in cubicles or single rooms.

At the confinements of these mothers—

70	were attended by medical men
22	by A Class Midwives
6,793	by B Class Midwives
1,623	by C Class Midwives
1,103	by friends and
370	were unattended.

9,981

As a supplement to the Municipal work the two Matrons of the Child Welfare Society of Singapore under the presidency of Lady CLIFFORD, saw 16,297 children at their two centres.

Thirty-one thousand three hundred and seventy-two infants were visited in their homes by the Society's health visitors, a considerable increase over previous year.

The children's play ground is becoming very popular. The new entrance of Chinese design is attractive, and the sand-pit is quite a good addition to the amenities of the site.

In Penang two European district nurses and 8 Chinese midwives, acting as part-time district nurses, were kept busy. Exact figures of the work done are not available.

The Government Women's and Children's out-door dispensary at Singapore under the charge of Mrs. C. H. DUKE, assisted by another Lady Medical Officer, and a Lady Assistant Surgeon, treated—

Eight thousand and forty-six children of the new cases in 1927 were children.

The three health sisters who have arrived started their work in Singapore and Penang in May, 1927. They possess special qualifications and experience in Infant and Maternal Welfare and in health teaching.

They have done good work. An account of their work appears under Appendix *P*.

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	<i>Admitted</i>	<i>Delivered</i>	<i>Gynæcological Operations</i>
1881	1,000	1,000	1,000
1882	1,000	1,000	1,000
1883	1,000	1,000	1,000
1884	1,000	1,000	1,000
1885	1,000	1,000	1,000
1886	1,000	1,000	1,000
1887	1,000	1,000	1,000
1888	1,000	1,000	1,000
1889	1,000	1,000	1,000
1890	1,000	1,000	1,000
1891	1,000	1,000	1,000
1892	1,000	1,000	1,000
1893	1,000	1,000	1,000
1894	1,000	1,000	1,000
1895	1,000	1,000	1,000
1896	1,000	1,000	1,000
1897	1,000	1,000	1,000
1898	1,000	1,000	1,000
1899	1,000	1,000	1,000
1900	1,000	1,000	1,000
1901	1,000	1,000	1,000
1902	1,000	1,000	1,000
1903	1,000	1,000	1,000
1904	1,000	1,000	1,000
1905	1,000	1,000	1,000
1906	1,000	1,000	1,000
1907	1,000	1,000	1,000
1908	1,000	1,000	1,000
1909	1,000	1,000	1,000
1910	1,000	1,000	1,000
1911	1,000	1,000	1,000
1912	1,000	1,000	1,000
1913	1,000	1,000	1,000
1914	1,000	1,000	1,000
1915	1,000	1,000	1,000
1916	1,000	1,000	1,000
1917	1,000	1,000	1,000
1918	1,000	1,000	1,000
1919	1,000	1,000	1,000
1920	1,000	1,000	1,000
1921	1,000	1,000	1,000
1922	1,000	1,000	1,000
1923	1,000	1,000	1,000
1924	1,000	1,000	1,000
1925	1,000	1,000	1,000
1926	1,000	1,000	1,000
1927	1,000	1,000	1,000
1928	1,000	1,000	1,000
1929	1,000	1,000	1,000
1930	1,000	1,000	1,000
1931	1,000	1,000	1,000
1932	1,000	1,000	1,000
1933	1,000	1,000	1,000
1934	1,000	1,000	1,000
1935	1,000	1,000	1,000
1936	1,000	1,000	1,000
1937	1,000	1,000	1,000
1938	1,000	1,000	1,000
1939	1,000	1,000	1,000
1940	1,000	1,000	1,000
1941	1,000	1,000	1,000
1942	1,000	1,000	1,000
1943	1,000	1,000	1,000
1944	1,000	1,000	1,000
1945	1,000	1,000	1,000
1946	1,000	1,000	1,000
1947	1,000	1,000	1,000
1948	1,000	1,000	1,000
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1959	1,000	1,000	1,000
1960	1,000	1,000	1,000
1961	1,000	1,000	1,000
1962	1,000	1,000	1,000
1963	1,000	1,000	1,000
1964	1,000	1,000	1,000
1965	1,000	1,000	1,000
1966	1,000	1,000	1,000
1967	1,000	1,000	1,000
1968	1,000	1,000	1,000
1969	1,000	1,000	1,000
1970	1,000	1,0	

Wards specially for children were maintained in Singapore at the General Hospital (36 beds) and at Kandang Kerbau (12 beds).

Hospitals for women and children with Maternity wards were also maintained by the Medical Mission under the Bishop of Singapore in Singapore and Malacca.

There is also a Chinese hospital with a Maternity Ward maintained by the Cantonese Community in Singapore.

VI.—HOSPITALS, DISPENSARIES AND VENEREAL CLINICS

1. Total in-patients treated and mortality in all Hospitals of the Colony for past six years:—

YEAR	NUMBER TREATED			NUMBER OF DEATHS			PERCENTAGE OF DEATHS		Percentage of deaths on total
	1st and 2nd class wards	3rd class wards	Total	European	Asiatics	Total	European	Asiatics	
1922	2,517	39,682	42,199	105	4,031	4,136	4.17	10.16	9.80
1923	2,858	38,835	41,693	92	3,835	3,927	3.22	9.87	9.42
1924	2,802	39,084	41,886	124	3,909	4,033	4.43	10.00	9.62
	Number treated 1st and 2nd class wards	Number of deaths 1st and 2nd class wards	Number treated 3rd class wards	Number of deaths 3rd class wards	Total 1st, 2nd and 3rd class wards		Percentage of deaths 1st and 2nd class wards		Percentage of deaths on total treated
1925	3,965	198	50,371	4,074	54,336	4,272	4.94	8.80	7.80
1926	7,614	387	60,400	5,346	68,014	5,733	5.09	8.85	8.42
1927	7,192	407	64,483	6,108	71,675	6,515	5.66	9.45	9.06

The total number of in-patients treated and the total deaths in the Hospitals of the Colony for some of the more important diseases are shown in the subjoined table with the corresponding figures for the preceding four years.

	1923		1924		1925		1926		1927	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Malarial Fevers	5,297	376	5,135	312	7,042	429	14,293	984	15,426	949
Dysenteries	1,566	454	1,387	373	1,295	366	1,987	575	1,561	511 <i>a</i>
Diarrhoea and Enteritis	485	22	544	41	696	67	928	89	1,412	158
Beri-Beri	962	28	838	136	995	150	1,228	221	1,786	361
Pulmonary Tuberculosis	1,714	789	1,778	849	1,966	819	1,964	853	1,941	952
Enteric Fever	92	39	93	37	159	78	258	85	302	132
Ulcers	2,577	2	2,618	10	3,357	2	4,795	4	3,266	5
Venereal Diseases	4,194	56	4,362	145	4,721	109	5,371	115	4,983	95
Ankylostomiasis	2,508	124	1,887	120	4,499	123	4,322	174	4,012	102

(a)—Dysentery Amoebic ... 847 cases — 262 deaths
 " Bacillary ... 507 " — 215 "
 " Unclassified ... 207 " — 34 "

3. The following terminal causes of death were noted in 670 fatal malarial cases :—

<i>Singapore.</i>					
	<i>Penang</i>	<i>Malacca</i>	<i>Tan Tock Seng's Hospital</i>	<i>General Hospital</i>	<i>Total</i>
Coma ...	81	113	—	11	205
Cardiac Failure ...	107	36	—	64	207
Hyper-Pyrexia ...	18	17	1	9	45
Pneumonia ...	12	—	13	13	38
Cachexia ...	21	17	—	8	100
Liver Failure ...	5	3	—	3	11
Enteritis ...	16	13	1	9	39
Ankylostomiasis ...	3	—	1	8	12
Nephritis ...	3	—	3	4	10
Ruptured Spleen (Spontaneous) ...	—	—	—	—	3

4. The approximate daily cost of diets per head in the Colonial Hospitals, was :—

					\$	c.
First Class	...	Full Diet	...	...	2	34½
„	...	Half „	...	...	2	30
Second Class	...	Full Diet	...	...	1	87¼
„	...	Half „	...	...	1	63½
Third Class (Chinese)		Full Diet	...	...		22
„	...	Half „	...	...		48¾
„	...	Milk „	...	...		32½
„ (Tamils)		Full Diet	...	...		24¼
„	...	Half „	...	...		48½
„	...	Milk „	...	...		32½
„ (Sikhs)	...	Full Diet	...	...		49
„	...	Milk „	...	...		48¾
„ (Bengali)	...	Full Diet	...	...		41
„	...	Milk „	...	...		48¾

OUT-DOOR DISPENSARIES.

<i>Year</i>		<i>Total Patients</i>	<i>Total Attendances</i>
—		—	—
1927	...	166,428	313,264
1926	...	159,903	312,090
1925	...	154,420	273,841
1924	...	96,284	167,934
1923	...	73,343	139,656
1922	...	58,005	99,488

The number of out-patients for Yaws was 7,971 as against 8,358 in the previous year. The disease is steadily decreasing owing to widespread and effective treatment of the sufferers. The attendances at the Women's and Children's Dispensary, Kandang Kerbau, Singapore, were 33,888, compared with 32,247 in 1925.

There are now two travelling motor dispensaries—one in Balik Pulau, Penang and one in Bukit Mertajam, Province Wellesley.

The travelling dispensary in Province Wellesley treated 7,948 cases with 9,387 attendances, while the travelling dispensary in Balik Pulau, which only started its work in August, treated 5,374 cases with 14,020 attendances.

In Singapore a travelling motor dispensary started its work in May: it treated 15,652 cases.

In Malacca the travelling motor dispensary treated 13,832 cases with 14,156 attendances.

BUILDINGS.

The new female ward at Bukit Mertajam Hospital was opened and occupied in August.

The new Mental Hospital at Trafalgar, Singapore, is almost completed.

VII.—PRISONS AND ASYLUM

A.—PRISONS

(a) *Singapore Prison*

1. The health of the prisoners was satisfactory and the sanitary condition of the Prison was good.

2. The water carriage system of sewage disposal has worked satisfactorily during the year.

3. *Admissions to the Prison Hospital.*—There were one thousand two hundred and thirty-six (1,236) admissions including 10 Europeans and six Eurasians. This with 31 remaining from the previous year gives a total of one thousand two hundred and sixty-seven (1,267). The average daily sick was 31.56 as against 29.03 in the previous year.

4. The principal diseases treated were:—

(a) Dysentery Amœbic	... 15	(f) Bronchitis	... 73
(b) Dysentery Bacillary	... 12	(g) Diarrhœa	... 103
(c) Dysentery Unclassified	10	(h) Skin Diseases	... 56
(d) Venereal Disease	... 51	(i) Intestinal Colic	... 161
(e) Fever not classified	... 170	(j) Dyspepsia	... 117
(k) Injuries	... 31		

5. *Deaths.*—There were 21 deaths in the Prison Hospital giving a death-rate of 1.65.

Of the deaths two occurred within 48 hours of admission. Excluding these the death-rate was 1.49.

6. Causes of death were:—

(a) Amœbic, Dysentery	... 3	(g) Acute lobar pneumonia	1
(b) Bacillary, Dysentery	... 3	(h) Chronic bronchitis and	
(c) Pulmonary Tuberculosis	6	Asthma	... 1
(d) Chronic Nephritis	... 2	(i) Subtertian malaria and	
(e) Broncho-Pneumonia	... 1	chronic bacillary dys-	
(f) Cerebral hæmorrhage	... 3	sentery	... 1

The grades of those who died were:—

(a) Long sentence prisoners	... 2
(b) Short sentence prisoners	... 6
(c) Middle Grade prisoners	... 7
(d) Upper Grade prisoners	... 5
(e) Banishee	... 1

7. Sixty-two cases were transferred to the General Hospital for major operations, of whom 3 died.

8. Twenty-two vagrants suffering from serious complaints were transferred to Tan Tock Seng Hospital for treatment.

9. Transfers to the Lunatic Asylum—2 vagrants and 6 criminals.
10. Transfers to the Leper Asylum—1 criminal.
11. Two deaths occurred in the association ward in the civil prison, the cause of death being in both cases from Hæmorrhage from rupture of spleen.
12. Suicide by hanging.—Nil.
13. *Executions*.—There were seven—5 Chinese, 1 Javanese and 1 Tamil.
14. *Corporal Punishment*.—There were 81 cases which were distributed as follows:—

(a) Cat-o'-nine tails	...	39	(b) Rattan	42
-----------------------	-----	----	------------	-----	-----	----

15. The figures of the different classes of Prisoners are shown from the following tables:—

	<i>Criminals</i>	<i>Civil</i>	<i>Vagrants</i>
	—	—	—
(a) Total population in Prison	... 3,476	4,947	248
(b) Average daily number in Prison	823	202·48	27
(c) Total treated in Prison Hospital	1,133	84	50
(d) Percentage of (c) to (a)	... 30·25	·23	20·16
(e) Total deaths in Hospital	... 21	—	—

16. One thousand three hundred and forty-two blood tests for Wassermann were taken during the year, of these 844 were negative and 498 positive showing a percentage of 2·71.

One hundred and twelve N. A. B. and forty-one Bismuth stab injections were given during the year.

17. Dr. J. M. A. LOWSON took over the duties of Medical Officer from Dr. J. C. CARSON in May.

Assistant Surgeon P. E. PEKEIRA took over charge from Assistant Medical Officer G. B. LEICESTER on 1st October.

Mr. A. DANKER, Hospital Assistant, Grade I, remained throughout the year.

(b) PENANG PRISON

1. *Admissions*.—

- (a) There were 9 cases remaining in Hospital at the beginning of the year. One hundred and sixty-three cases including 45 vagrants were admitted during the year, making a total of 172 cases treated as compared with 207 cases treated in 1926.

- (b) The daily average number of sick for the year was 10·21 as compared with 8·82 for the previous year.

2. *Diseases*.—The principal diseases treated among the in-patients were as follows:—

Malaria	...	...	...	...	31
Tuberculosis	...	...	...	...	3
Venereal Diseases	...	...	...	...	12
Diseases of Respiratory system	...	...	...	...	16
Bowel disorders	...	...	...	...	20
Ankylostomiasis	...	...	...	...	5
Skin diseases	...	...	...	...	12
Injuries	...	...	...	...	10

3. *Deaths*.—

- (a) There were 8 deaths during the year with a death-rate of 4·65 as compared with 2 deaths and a death-rate of ·96 the previous year. Of the total number of deaths 3 occurred among vagrants.

(b) The causes of deaths were:—

Dysentery	...	...	...	...	2
Leprosy	...	...	...	...	1
Tuberculosis	...	...	...	...	2
Lobar Pneumonia	...	...	...	...	1
Anæmia	...	...	...	...	1
Debility	...	...	...	...	1

4. *Out-patients.*—

(a) One thousand two hundred and ninety-two cases were treated as out-patients during the year as compared with 877 cases in the previous year. The average daily attendance was 17·27. The principal diseases treated among out-patients were:—

Venereal diseases	...	...	...	...	136
Pyrexia of unknown origin	...	...	...	...	195
Opium habit	...	...	...	...	143
Diseases of the respiratory system	...	...	...	...	256
Bowel disorders	...	...	...	...	125
Skin diseases	...	...	...	...	135
Eye affections	...	...	...	...	15
Injuries	...	...	...	...	47

5. *Wassermann Re-action.*—

(a) Nine hundred and ninety-seven specimens of blood were taken for the Wassermann test as compared with 662 in 1926.

(b) Two hundred and seventy-four gave a positive result as against 261 in the previous year.

(c) Two hundred and forty intravenous injections of N. A. B. were given as against 276 in 1926.

6. *Hookworm.*—

(a) One thousand and forty-two specimens of stool were examined for ova intestinal parasites, etc., as compared with 676 in the previous year.

(b) Five hundred and sixty-nine were found to be positive to ova as compared with 415 in 1926.

(c) Four hundred and ten received hookworm treatment during the year.

7. *Prison Strength.*—There were 167 prisoners and 30 vagrants remaining at the beginning of the year. One thousand two hundred and sixty-three were admitted during the period under review. Of the total admitted nine hundred and forty-five were prisoners and 318 vagrants. The number of prisoners and vagrants remaining on 31st December, 1927, was 199 and 65 respectively.

8. *Judicial Hanging.*—There were no cases of judicial hanging during the year.

9. The sanitary condition of the prison, and the health of the prison staff and prisoners, were satisfactory throughout the year.

10. *Staff.*—Dr. R. LETCHMANASAMY was in charge until 31st January, 1927, when Dr. R. W. NICKELSON returned from leave and was in charge for the remaining period.

(c) MALACCA PRISON

There were 76 admissions to the Prison Hospital with 1 death.

There were 23 cases of Malaria which accounted for the 1 death.

The daily average number of sick was 0.89.

The daily average number of inmates was as follows:—

Prisoners	...	...	...	...	0.13
Remands	...	...	...	...	0.005
Vagrants	...	...	...	...	0.06

There were no executions during the year.

B.—SINGAPORE MENTAL HOSPITAL

1. There remained on 31st December, 1926, five hundred and eighty-eight males and one hundred and thirty-five females. Two hundred and ninety-three males and seventy-seven females were admitted during 1927.

The total treated was one thousand and ninety-three persons.

2. Of the admissions seventeen males and eight females had previously been under treatment in this Mental Hospital.

3. Of the total treated one hundred and four males and twenty-one females were discharged as recovered; twenty-eight males and fifteen females as improved; six males and three females as not improved; four males were discharged as not insane on admission.

Ten males and one female absconded. Ninety-five males and twenty-six females died.

4. There remained on 31st December, 1927, six hundred and thirty-four males and one hundred and forty-six females.

5. The average daily number was 611.99 males and 141.40 females.

6. The maximum and minimum daily number respectively were seven hundred and ninety and seven hundred and fourteen.

7. The nationalities of the admissions were:—

				<i>Males</i>	<i>Females</i>
				—	—
British	...	...	...	3	1
Other Europeans	...	...	...	2	—
Eurasians	...	...	...	6	4
Chinese	...	...	...	185	52
Tamils	...	...	...	57	8
Malay and Allied Races	...	...	...	26	8
Others	...	...	...	14	4

8. The Physical condition of those admitted was:—

				<i>Males</i>	<i>Females</i>
				—	—
Good	...	...	...	166	36
Fair	...	...	...	81	27
Impaired	...	...	...	40	10
Greatly impaired	...	...	...	6	4

9. Twenty-one patients died within one month of admission.

10. With regard to the causation of insanity "Fever", alcohol, and mental stress are mentioned as possible causes. The special periods of stress in life have been associated with some cases of mental disorder.

Thirty-eight cases admitted during the year had a history of previous insanity. The Wassermann Reaction for syphilis was negative in about two-thirds of those admissions, in which this examination was undertaken.

11. The recovery rate for the year was 33.78.

12. Criminal population—there remained on 31st December, 1926:—

	<i>Males</i>	<i>Females</i>
	—	—
(a) Criminal lunatics	26	2
(b) Lunatic criminals (excluding va- grants)	13	—

During 1927—Criminal lunatics—

	<i>Males</i>	<i>Females</i>
	—	—
(a) Number admitted	8	1
(b) Number who recovered and were returned to the Civil Prison ...	4	—
(c) Number who died	1	—

12. Lunatic Criminals:—

	<i>Males</i>	<i>Females</i>
	—	—
(a) Number admitted	6	—
(b) Number whose sentence expired ...	1	—
(c) Number who recovered	8	—
(d) Number who absconded	—	—
(e) Number who died	—	—

There remained on 31st December, 1927:—

	<i>Males</i>	<i>Females</i>
	—	—
(a) Criminal lunatics	29	3
(b) Lunatic criminals	10	—

13. *Mortality*.—The death-rate based on the average daily number was 16.06.

The chief causes of death were in order of frequency, dysentery, general paralysis of the insane, and pulmonary tuberculosis.

These three diseases accounted for just over half the total number of deaths. One case of suicide occurred during the year, (hanging).

14. *Industries*.—Nine thousand, seven hundred and ninety-two yards of cotton cloth were woven by the male patients for use in the Mental Hospital.15. *Revenue*.—Twelve thousand six hundred and fifty-eight dollars and ten cents.

16. The area of garden belonging to the Mental Hospital has gradually been reduced, the land being required for other purposes. The amount of garden produce therefore available for the patients has become more limited.

17. The number of Straits Settlements patients under care and control for mental disorder again shows a considerable increase in 1927 and is almost identical with the number admitted in 1926.

18. Dr. C. T. DE SOUZA, Assistant Medical Officer at the Mental Hospital, ceased his duties on 23rd August, 1927, going on leave previous to retirement. He had served over 13 years at the Institution.

Dr. G. B. LEICESTER was transferred to the Mental Hospital on October 1st, 1927, to undertake duty in place of Dr. DE SOUZA.

During the intervening period Dr. McINTYRE acted.

VIII.—METEOROLOGICAL

Since 1869 the Medical Department has kept records of the rainfall, temperature, humidity and barometer.

The mean temperature for the year was above the normal: it was 79·6° F in Singapore, 82·3° F for Penang, 82·0° F for Province Wellesley and 79° F for Malacca.

The driest month in Singapore was July, 27 millimetres, and the wettest January, 337 millimetres of rain.

The total rainfall for the year in Singapore was 2,576 millimetres as against 2,172 millimetres in 1926.

The driest month in Penang was July when 86 millimetres of rain fell. The wettest month was in April, 312 millimetres of rain. The total rainfall for the year in Penang was 2,276 millimetres as against 2,967 millimetres in 1926.

The driest month in Malacca was February, 31 millimetres of rain. The wettest month was October, 387 millimetres. The Malacca rainfall totalled 2,633 millimetres as against 2,409 millimetres in 1926.

Remarks on the effects of the deficient and unevenly distributed rainfall on the mortality will be found in Part II of this report—Public Health.

An effort to bring the meteorological conditions to the notice of the inhabitants was continued by furnishing the most important data to the Singapore European papers daily. It is gratifying to note that the reports are displayed in a suitable part of the paper, where they can catch the eye without difficulty.

A further effort has been made to inform the public of the weekly condition of the various hill stations, in the neighbourhood. The returns from Garoet in Java, and Brastagi in Sumatra, are a weekly mean of returns taken during several years' past, since it is impossible to obtain a weekly telegram without payment. The returns from Penang Hill, Taiping Hill and Fraser's Hill are telegraphed to the department each week.

Meteorological returns for the year will be found in Table *IV* and also two graphs supplied by Dr. GILBERT BROOKE showing the wettest and driest months since 1869, and the annual rainfall in inches and millimetres since 1862.

IX.—SCIENTIFIC

The following reports are attached as Appendices:—

- A. Report on Leper Asylum, Singapore.
- B. Report on Treatment of Leprosy in Pulau Jerejak Leper Settlement.
- C. Report on the Pathological Branch, Straits Settlements.
- D. Report on the Analyst's Branch, Straits Settlements.
- E. Second Annual Report of the Straits Settlements Rural Sanitation Campaign.
- F. Report on Tan Tock Seng Hospital, Singapore.
- G. Report on Treatment of Scabies by the Danish Method.
- H. Report on the treatment of the Opium Habit.
- I. Report on Women's and Children's Dispensary, Kandang Kerbau.
- J. Report of the Radiologist, Singapore.
- K. Reports on Schools.
- L. Report on Social Hygiene.
- M. Scientific Report by the Professor of Biology.
- N. Scientific Report by the Professor of Bacteriology.
- O. Scientific Report by the Professor of Bio-Chemistry.
- P. Report on Infant and Child welfare Work in the Rural Districts of Singapore.
- Q. Report on treatment of yaws and syphilis in the Balik Pulau District.

J. GRAY,

*Acting Principal Civil Medical Officer,
Straits Settlements.*

APPENDIX "A"

LEPER ASYLUMS

I.—LEPER ASYLUM, SINGAPORE

REPORT BY DR. J. C. CARSON, M.B., B.Ch., B.A.O., D.T.M.

1. *Male Leper Camp*—

Remained on 31st December, 1926	...	...	37
Admitted during 1927 ...	...	...	86
			<hr/> 123
Discharged during 1927	...	...	3
Died ,, ,,	...	...	9
Absconded ...	...	...	7
Transferred to Pulau Jerejak	...	...	75
Remaining on 31st December, 1927	...	...	29
			<hr/> 123

Immediate causes of death—

Sapraemia from septic ulcerations	...	...	2
,, ,, advanced leprosy	...	...	2
Pleurisy with effusion ...	..	...	1
Chronic parenchymatous nephritis	...	...	2
Lobar pneumonia ... ...	...	...	2
			<hr/> 9

2. *Female Leper Camp*—

Remained on 31st December, 1926	...	...	51
Admitted during 1927 ...	...	..	15
			<hr/> 66
Discharged during 1927	...	...	5
Died during 1927 ... ...	...	...	6
Remaining on 31st December, 1927	...	...	55
			<hr/> 66

Immediate causes of death—

Sapraemia from septic ulcerations	...	...	2
Pulmonary Tuberculosis	...	...	2
Lobar pneumonia ... ...	...	...	1
Chronic parenchymatous nephritis	...	...	1
			<hr/> 6

Return of injections administered—

		<i>Male</i>	<i>Female</i>
		—	—
Oil Hydnocarpus with .5% Iodine	...	1,302	3,920
Sod. Hydnocarpus with .5% acid carbolic		261	24
E. C. C. O.	... ..	175	440
Sod. Morrhuate	... ..	28	—
Sod. Soyate	... ..	44	—
Sod. Morrhuate and Soyate	... ..	56	—

Result of Treatment—

Cured	... ..	1	5
Definite Improvement	... ..	1	7
Slight Improvement	... ..	22	20
Stationary	... ..	60	11
Retrogressing	... ..	14	9

Treatment—

(a) Intercurrent diseases such as ankylostomiasis and Beri-beri were given treatment before anti-leprotic treatment was actually begun.

(b) The main drug used in treatment was Oil of Hydnocarpus Wightiana with .5% Iodine injected bi-weekly into the subcutaneous tissue. The commencing dose for adults is 2 cc., increasing by .5 cc. at each subsequent injection until a maximum dose of 5 cc. is reached. The area injected is gently massaged to distribute the oil evenly and thus increasing its powers of absorption. The drug is well tolerated and the reactions are mild.

The transfer of the female lepers to Trafalgar has had most beneficial results both physically and mentally on the patients. Mr. TAN ENG HAN was in charge of both camps from 1st January, 1927 to 31st October, 1927, and Mr. H. R. SARAVANAMUTTU, from 1st November, 1927 to 31st December, 1927.

APPENDIX "B"**TREATMENT OF LEPROSY AT PULAU JEREJAK.**

By Dr A. H. WHEATLEY, *Deputy Medical Officer, Leper Settlement.*

Five hundred and six cases were under special treatment for Leprosy for the year 1927. Out of this numbers 349 cases were of the advanced type.

The lowering of the death-rate from 30.68 in 1921 to 14.00 in 1927 shows how beneficial special treatment is to all cases.

The first essential, before commencing any special treatment for Leprosy, is to improve the general health. The majority of admissions are ill fed, debilitated subjects and in a most insanitary condition.

With good dieting, regular hours, proper skin sanitation, and treatment of any intercurrent disease, such as malaria, hook-worm, syphilis, chronic dysentery, they rapidly show improvement.

Special treatment is then commenced. This consists of the injection, once weekly of fresh Hydnocarpus Wightiana, Oil, to which is added 4% Creosote. This is thoroughly sterilised, and injected subcutaneously, on the extensor surfaces of the body in the following order, right upper limb, left upper limb, right gluteal region, left gluteal region, antero external surface, right thigh, antero external surface, left thigh, postero external surface, right thigh, postero external surface, left thigh.

Dosage.—This varies with the severity of the case.

In cases with light infection and few lesions, the smaller commencing dose has been 4 c.cs., increased by 2 c.cs., at each subsequent injection to a maximum of 10 c.cs.

In cases with heavy injection and diffuse lesions, a smaller commencing dose of 1 to 2 c.cs., gradually increased to 6, 8 or 10 c.cs., depending on the tolerance to the drug.

In cases, more of the nerve than the skin type, a larger commencing dose of 6 c.cs., rapidly rising to 10 c.cs., has been given.

In all cases the size of the dose varies with the tolerance of the case to the drug injected.

In cases with localised skin lesions, few in number, it is advantageous to give injections into these lesions by subcutaneous infiltration, in addition to the regular subcutaneous injections. The method of infiltration is as follows:—

The needle is inserted at one edge of the leprous patch, up to the hilt and $\frac{1}{2}$ to 1 c.c. of the oil is injected. It is then withdrawn but not completely, and inserted at a different angle. This is repeated twice more, and then the needle is withdrawn completely, so that with only one puncture, four injections have been given.



There is very little pain on injecting the oil, if given slowly. The part injected into should be gently massaged to distribute the oil evenly.

After a course of the oil injections, Sodium Hydnocarpate 1% solution with $\frac{1}{2}$ % acid carbollic, is injected once weekly, intravenously, for 10 occasions. The commencing dose has been 1 c.c. increased by 1 c.c. at each subsequent injection to the maximum dose of 10 c.cs.

After this course, a rest of two weeks from all injection treatment is taken and then the oil is commenced again.

On non-injection days, pure Hydnocarpus oil in 10 min.: doses, in capsules, is taken twice daily, increased gradually as long as there is nausea.

The main idea in the treatment is to keep within the border line of a reaction, and, if a reaction does occur, "withhold all treatment till it passes".

If reactions are persistent, and prolonged, intravenous injections of Antimony Potassium Tartrate 0.02 gramme are very useful in stopping them.

Daily baths are very necessary, and those who pay attention to their personal cleanliness improve more rapidly.

Exercise is very important; walking, carpentry, gardening, swimming, skipping, and drilling are all encouraged.

Bowel sanitation is very important. A purge often relieves the neurotic pains the cases so frequently suffer from.

For severe neurotic pains, intramuscular injections of Adrenalin Hydrochloride, mins 2 to 3 of 1—1,000 Solution diluted with 2 c.cs., normal saline, rapidly relieves them. Sodii Salicylas is also useful.

Applications of Acid Trichloroacetic, 1 in 1 for nodules, and 1 in 3 for face and diffuse lesions, are useful in clearing the patches. It is painted once every 8th day, and the right amount of painting is indicated by a whitening of the skin as the Solution dries.

Tai Fong Chee consisting of 3 parts Hydnocarpus Wightiana Kernels with 1 part Hemp seed, pounded together, and given in a dosage of 20 grains, twice daily, is useful in cases unsuitable for injection treatment.

The result of treatment on these lines has not only decreased the death-rate from 30 to 14 per cent within the last ten years but it has improved the mental factor a great deal. Patients who were morose formerly are more cheerful now, and the majority state that there is a better sense of well-being.

The following figures show the result of treatment:—

Number treated on Special lines	...	...	...	506
Lesions disappeared	...	...	...	10
Definitely improved	...	...	...	136
Improved	...	...	...	290
Not improved	...	...	...	70
				<hr/> 506

The ten cases in which the lesions have disappeared are bacteriologically negative.

Some cases are illustrated on the following pages.

A. H. WHEATLEY,
Deputy Medical Officer,
Leper Asylum, Pulau Jerejak.

FEMALE LEPER WARDS, JELUTONG.

1. Number of patients remaining at end of 1926	...	...	...	Colonial	31	
				Non-Colonial	7	38
2. Admitted 1927	...	...	...	Colonial	12	
				Non-Colonial	1	13
3. Died 1927	...	...	...	Colonial	7	
				Non-Colonial	—	7
4. Death-rate 1927	...	7.28				
,, 1926	...	5.2				
5. Discharged 1927	...	...			1	1
Absconded ,,	...	...			1	1
6. Remained 1927	...	...	...	Colonial	34	
				Non-Colonial	8	42
7. Average number of patients—1927	...				38.48	
1926	...				40.27	

8. Treatment.—

(a) *General*.—All cases take internally Hydnocarpus oil in capsules up to toleration. Counter irritation with trechlor-Acetic Acid is carried out to all cases.

(b) *Selected*.—Twenty-one cases were getting subcutaneous injections of Hydnocarpus oil with 4% Creosote once a week. Initial doses 2 c.c. increased weekly by 2 c.c. The maximum dose was 10 c.c. followed by a fortnightly rest. The intravenous injection is 1% solution of Sodium Hydnocarpate in normal saline.

The dosage is similar to that of the oil. Then the whole treatment is repeated.

9. Result of Treatment.—Six cases show well marked improvement.

Five cases show no improvement.

Ten cases are better than when they came in.

10. Assistant Surgeon PONNIAH has been in charge of the Asylum under the supervision of Dr. WHEATLEY.

PHOTOGRAPH NOT REPRODUCED

JESUDASAN

TAMIL

Leprous patches, face, body, and on amputation stump.

Ears very thickened.

PHOTOGRAPH NOT REPRODUCED

JESUDASAN

All patches have disappeared.
Ears are quite normal.

PHOTOGRAPH

OOI PENG GUAN

CHINESE

Marked leprous lesions of whole body

NOT REPRODUCED

in a stage of intense reaction.

PHOTOGRAPH

OOI PENG GUAN

Free from all

NOT REPRODUCED

signs of leprosy.

PHOTOGRAPH

SCOUT PATROL OF
OOI PENG GUAN.
(apparently cured).
Scout Master.

NOT REPRODUCED

LEPER LADS

PHOTOGRAPH NOT REPRODUCED

MARTHARASAMY

TAMIL

Ears very thickened. Leprous patch on right of face, below eye.
Peculiar mottled appearance of skin of body.

PHOTOGRAPH NOT REPRODUCED

MARTHARASAMY

After treatment.

Free from all signs of Leprosy.

PHOTOGRAPH NOT REPRODUCED

SINNATAMBY

. . . TAMIL .

Skin of fore-head thickened. : Leprous patches on face
Ears thickened.

PHOTOGRAPH NOT REPRODUCED

SINNATAMBY

After treatment.

Free from all signs of Leprosy.

PHOTOGRAPH NOT REPRODUCED

CHIAH AH CHOON

CHINESE

Large Leprous patches on body

Smaller patches on face.

In a stage of reaction as well.

PHOTOGRAPH NOT REPRODUCED

CHIAH AH CHOON

After treatment.

All patches have cleared up.

APPENDIX "C"

PATHOLOGICAL BRANCH

I. SINGAPORE

REPORT BY J. C. TULL, M.B., M.R.C.P. (LONDON), *Government Pathologist.*

PATHOLOGICAL LABORATORY, SEPOY LINES

Total Number of specimens examined	...	...	4,940
Blood films—			
Malaria parasites present	...	...	19
Malaria parasites absent	...	...	205
Differential count and total cell count		...	17
		—	241
Bloods sugar estimations	...	...	4
Cerebro-spinal fluid—			
Meningococci present	...	...	1
Negative to organisms	...	...	8
Globulin, Albumin and cell count	...	...	9
		—	18
Fluid from pleural sac	...	...	5
Examination of pus, etc.	...	...	6
Fæces—			
Entamœba histolytica, present and active	...	...	2
Entamœba histolytica, cysts present	...	...	1
Whipworm ova, present	...	...	16
Ova of ankylostomes, present	...	...	8
Ova of ascaris lumbricoides, present	...	...	9
Strongyloides stercoralis, present	...	...	2
Occult blood, present	...	...	7
Occult blood, absent	...	...	4
		—	30
<i>Exhibits from police for presence of human blood—</i>			
Human blood, present	...	...	35
Human blood, absent	...	...	17
		—	52

Films for presence of gonococci—

present	...	...	...	5	
absent	...	...	...	11	
				—	16

Films for presence of B. lepræ—

absent	...	...	...	6	
				—	6

Films from exudate conjunctiva 2*Examination of material for Treponema pallidum* ... 12*Sputum—*

B. tuberculosis, present	...	...	...	12	
B. tuberculosis, absent	...	...	...	63	
Pneumococcus, „	...	...	...	1	
				—	76

Urine—

albumin, casts, and microscopically	...	...	...	136	
Trichomonas vaginalis, present	...	...	...	4	

Antogenous vaccines 14*Widal Reactions—*

B. typhosus, positive	...	...	...	1	
negative	...	...	...	12	
B. paratyphosus A, positive	...	...	...	0	
negative	...	...	...	3	
B. paratyphosus B, positive	...	...	...	2	
negative	...	...	...	2	

Wassermann Reaction; (blood and cerebro-spinal fluid)—

Positive	+	+	...	...	...	1,213
Positive	+	...	...	...	...	507
Positive	...	...	...	...	...	299
Negative	...	...	...	...	...	1,970
					—	Total 3,989

MORBID HISTOLOGY

<i>Nature of Tissue</i>	<i>Site</i>	<i>Nationality</i>	<i>Age</i>	<i>Sex</i>
Papilloma (simplex)	Bladder	... Chinese	46	Male
"	Abdominal wall	.. Eurasian	7	Female
"	"	... ?	?	?
"	Ear	... Chinese	14	Male
"	"	... "	23	"
"	Penis	... ?	?	?
"	Tongue	... Chinese	10	Female
"	"	... "	10	"
"	?	... "	27	"
Polypus ...	Cervix uteri	... European	42	"
Total				10
Epithelioma	Penis	... "	23	Male
"	"	... Chinese	40	"
"	"	... "	43	"
"	"	... Japanese	37	"
"	"	... Chinese	37	"
"	"	... Japanese	42	"
"	"	... Chinese	65	"
"	Groin	... "	65	"
"	Anus	... Malay	?	"
"	?	... Bengali	23	"
"	Cheek	... Chinese	34	"
"	Tongue	... Tamil	27	"
"	Cervic uteri	... "	32	Female
"	"	... Japanese	47	"
"	"	... ?	56	"
"	"	... Tamil	36	"
"	"	... Chinese	42	"
"	"	... "	42	"
"	"	... "	36	"
"	"	... "	36	"
"	Foot	... "	35	Male
"	Lip	... European	40	"
"	Vagina	... Chinese	42	Female
"	Bladder	... "	40	Male
"	Larynx	... ?	?	?
"	Eyelid	... Malay	40	Male
Total				27
Carcinoma	Liver (primary)	... Chinese	37	Female
"	"	... "	41	Male
"	"	... "	50	"
"	"	... "	58	"
"	"	... "	40	"
"	"	... "	?	"
"	"	... Malay	26	"
"	"	... Tamil	25	"
"	"	... Chinese	39	"
"	"	... "	36	"
"	"	... "	47	"
"	"	... "	32	"
"	"	... "	?	"
"	"	... "	49	"
"	Lung (secondary)	... "	53	"
"	"	... "	?	"
"	"	... "	49	"
"	"	... "	?	"
"	Glands	... Bengali	44	"

MORBID HISTOLOGY—*Continued*

<i>Nature of Tissue</i>		<i>Site</i>		<i>Nationality</i>	<i>Age</i>	<i>Sex</i>
Carcinoma	..	Glands	...	Chinese	32	Female
"	...	"	..	"	58	Male
"	...	"	...	"	42	"
"	...	"	...	Japanese	67	"
"	...	"	...	Chinese	?	"
"	...	"	...	"	39	"
"	...	"	...	European	65	"
"	...	"	..	Tamil	55	"
"	...	"	...	Chinese	65	Female
"	...	"	...	"	47	Male
"	...	"	...	Tamil	55	"
"	...	Face	...	Chinese	55	"
"	...	Stomach (onsite ulcer)	old	European	55	"
"	...	"	...	Chinese	34	"
"	...	Ovary	...	"	34	Female
"	...	Uterus	...	"	49	"
"	...	"	...	Bengali	49	"
"	...	"	...	Eurasian	50	"
"	...	Orbit	...	Chinese	53	Male
"	...	Pharynx	...	European	60	"
"	..	"	...	"	65	"
"	...	"	...	Chinese	60	Female
"	...	"	..	"	62	Male
"	...	Tonsil	...	Tamil	14	Female
"	..	Prostate	...	Chinese	63	Male
"	...	"	...	"	39	"
"	...	Stomach	...	"	53	"
"	...	Pancreas	...	"	48	"
"	...	Parovarian Cyst.	...	"	37	Female
"	...	Breast	...	Eurasian	34	"
"	...	"	...	Chinese	?	"
"	...	"	...	"	53	"
"	...	"	...	"	?	"
					Total	52
Rodent ulcer	...	Face	...	"	80	Male
					Total	1
Endothelioma	...	Pleura	...	"	?	"
					Total	1
Sarcoma	...	Uterus	...	"	27	Female
"	...	Thigh	...	"	37	Male
"	...	Sac of hydrocele	...	Bengali	35	"
"	...	Antrum of Highmore	...	Chinese	?	"
"	...	Femur	...	Bengali	?	"
"	...	Prepuce	...	European	68	"
"	...	Penis	...	Bengali	38	"
"	...	Mediastinum	...	Eurasian	24	"
"	..	Rectus abdominis	...	Chinese	34	"
"	...	Glands neck	...	"	26	"
"	...	"	...	"	27	"
"	...	Parovarian Cyst.	...	Tamil	40	Female
"	...	Ovary	...	Chinese	26	"
"	...	Omentum	...	"	26	"
"	...	Thyroid	...	"	30	Male
"	...	Jaw	...	"	44	"

MORBID HISTOLOGY—*Concluded*

<i>Nature of Tissue</i>	<i>Site</i>	<i>Nationality</i>	<i>Age</i>	<i>Sex</i>
Lympho sarcoma ...	Heart ...	... Chinese	40	Male
„ ...	Kidney ...	... „	40	„
„ ...	Transverse colon. ...	... „	37	„
„ ...	Duodenum	... „	32	„
Total				20
Hypernephroma ...	Kidney ...	... European	24	„
Total				1
Glioma ...	Brain ...	...	31	„
Total				1
Chorionepithelioma	Uterus ...	... Tamil	20	Female
„	„ ...	... Chinese	31	„
Total				2
Chondroma ...	?	... ?	?	?
Total				1
Rhinosporidiosis ...	?	... ?	?	?
Total				3
Fibroma and fibro-myoma ...	?	... ?	?	?
Total				11
Leproma ...	?	... ?	?	?
Total				1
Actinomycosis ...	?	... ?	?	?
Total				1
Schistosomiasis ...	?	... ?	?	?
Total				1
Parovarian cysts ...	?	... ?	?	?
Total				3
Hæmangioma ...	Scalp ..	... Chinese	12	Male
Total				1
Cirrhosis liver ...	Liver ?	?	?
Total				3
Gumma ...	„ ?	?	?
Total				2
Acute inflammations various tissues ...	?	... ?	?	?
Total				54
Chronic inflammations various tissues ...	„	... „		„
Total				72
Unclassified sections	„	.. „		„
Total				21
Total number Histological Sections 303.				

TAN TOCK SENG HOSPITAL MORTUARY

Total number of post mortem examinations	...	2,232
Number at which protocols were taken	...	2,038
Coroner's cases	...	350
Post mortem examination of patients dying within 24 hours of admission	...	349
Post mortem examination of patients dying within 48 hours of admission	...	163

Return showing immediate cause of death:—

Beri-beri	...	209
Dysentery—Amœbic	...	117
Bacillary	...	123
Mixed type	...	6
Amœbic abscess of liver	...	3
Typhoid fever	...	46
Pneumonia—Lobar	...	342
Broncho	...	75
Endocarditis—Aortic Chronic	...	40
Aortic Acute	...	8
Mitral Chronic	...	2
Mitral and aortic—Chronic	...	1
Myocarditis	...	44
Malaria	...	326
Pericarditis	...	6
Meningitis	...	8
Hæmorrhage—Secondary	...	2
Neoplasms	...	39
Senility	...	8
Suppurative peritonitis	...	61
Ankylostomiasis	...	7
Still-born	...	9
Various septic conditions	...	74
Tetanus	...	6
Pulmonary Tuberculosis	...	380
Visceral syphilis	...	15
Congenital syphilis	...	4
Chronic gastric ulcer with pyloric obstruction	...	5
Gangrene lung	.....	3
Abscess lung	...	6
Hypostatic pneumonia	...	13
Chronic empyema	...	1
Aortic aneurysms	...	3
Leprosy	...	9
Cerebral softening	...	6
Cerebral abscess	...	2
Cerebral hæmorrhage	...	1
Tuberculosis spine	...	3
Acute lymphatism	...	1
Chronic nephritis	...	74
Pyonephrosis	...	1
Pyelo-nephritis	...	7
Schistosomiasis	...	2

Dying of diseases referable to systems:—

Alimentary system	...	294
Circulatory system	...	51
Genito-urinary system	...	75
Nervous system	...	25
Respiratory system	...	784

Return showing incidence of diseases:—

Pulmonary tuberculosis	...	...	...	447
Malaria—Subertian	...	...	...	313
Benign tertian	...	...	...	44
Quartan	...	...	...	7
Mixed S. T. and B. T.	...	...	...	23
S. T. and Quartan	...	...	...	3
Chronic (Malarial Cachexia)	...	...	...	128
		Total	...	518
Pneumonia—Lobar	...	...	...	375
Broncho	...	...	...	138
Dysentery—Amœbic	...	...	...	173
Bacillary	...	...	...	135
Mixed	...	...	...	6
Typhoid fever	...	...	...	49
Neoplasms—Carcinoma, primary	...	...	...	43
,, secondary	...	...	...	27
Sarcoma	...	...	...	3
Lymphosarcoma	...	...	...	2
Meningitis	...	...	...	15
Schistosomiasis (Japonicum)	...	...	...	3
Beri-beri	...	...	...	229

*Return showing systems affected.**Nervous system:—*

Cerebral softening	...	...	...	10
Cerebral hæmorrhage	...	...	...	4
Cerebral abscess	...	...	...	2
Cyst frontal lobe	...	...	...	1
Cerebral thrombosis	...	...	...	1
Hernia cerebri	...	...	...	1
Gumma skull	...	...	...	1
Tuberculous caries spine	...	...	...	4
Gumma brain	...	...	...	1
Gumma meningis	...	...	...	1
Meningitis—pneumococcic	...	...	...	2
Syphilitic	...	...	...	8
tuberculous	...	...	...	2
septic (following tramma)	...	...	...	4
Hydrocephalus	...	...	...	3
Oedema brain	...	...	...	1

Circulatory system:—

Acute cardiac dilatation	...	...	...	48
Endocarditis—aortic—chronic	...	...	...	25
aortic—acute, ulcerative	...	...	...	12
Mitral—chronic	...	...	...	8
Mitral—acute, ulcerative	...	...	...	5
Myocarditis	...	...	...	58
Pericarditis — pneumococcic	...	...	...	27
tuberculous	...	...	...	2
septic (following tramma)	...	...	...	2
adherent pericardium	...	...	...	5
hæmorrhage pericarditis	...	...	...	1
“milk spots”	...	...	...	20
Aneurysms, thoracic: 6. (two of which had ruptured)				
Aneurysmal dilation of thoracic aorta	...	...	...	12
Senile arterio sclerosis	...	...	...	51
Atheroma pulmonary artery	...	...	...	1
Lymphosarcoma of heart	...	...	...	1

Respiratory system:—

Tuberculosis larynx	...	...	...	8
Emphysema	...	...	...	11
Pleurisy, with effusion, tuberculous	...	...	...	111
Empyema	...	...	...	35
Pulmonary collapse	...	...	...	24
Infarct lung	...	...	...	4
Bronchiectasis	...	...	...	1
Gangrene lung	...	...	...	11
Abscess lung	...	...	...	15
Chronic bronchitis	...	...	...	2
Acute pleuritis	...	...	...	131
Pneumonia-lobar—Bilateral	...	...	...	129
Rt. upper lobe	...	...	...	20
Rt. upper and middle lobes	...	...	...	9
Rt. middle and lower lobes	...	...	...	20
Rt. middle only	...	...	...	3
Rt. upper and lower lobes	...	...	...	3
Rt. lower lobes	...	...	...	57
Massive-right lung	...	...	...	32
Left upper lobe	...	...	...	19
Left lower lobe	...	...	...	52
Massive, left lung	...	...	...	3
Unresolved	...	...	...	11
Pneumonia—broncho	...	...	...	139
Pneumonia—hypostatic	...	...	...	38
Pulmonary tuberculosis — active	...	...	...	412
chronic	...	...	...	12
quiescent	...	...	...	16
miliary	...	...	...	7
Gumma sternum	...	...	...	2
Oedema lungs	...	...	...	38
Neoplasms — Metastases from cancer liver	...	...	...	6
Carcinoma larynx	...	...	...	1
Endothelioma pleura	...	...	...	1

Alimentary system:—

Ulceration (from corrosive) œsophagus	...	...	...	1
Gastric ulcer — acute	...	...	...	1
chronic	...	...	...	18
chronic with perforation	...	...	...	6
chronic with acute hæmorrhage	...	...	...	1
Acute intestinal obstruction	...	...	...	1
Inguinal hernia	...	...	...	3
Strangulated inguinal hernia	...	...	...	2
Acute appendicitis	...	...	...	10
Gangrene intestine (small)	...	...	...	1
Gangrene caecum	...	...	...	1
Prolapse rectum	...	...	...	1
Volvulus	...	...	...	1
Acute enteritis (cause undetermined)	...	...	...	17
Typhoid fever, (seventeen perforated)	...	...	...	66
Schistosomiasis intestine	...	...	...	3
Tuberculous intestine	...	...	...	41
Tuberculous peritonitis	...	...	...	3
Dysentery—amœbic — acute	...	...	...	58
chronic	...	...	...	118
subacute	...	...	...	3
bacillary	...	...	...	135
mixed	...	...	...	6
Cirrhosis liver	...	...	...	222

Alimentary system—continued.

Abscess liver—amœbic	...	...	...	9
pyæmic	...	...	...	4
Subphrenic abscess	...	...	...	2
Tuberculosis liver	...	...	...	2
Gumma liver	...	...	...	6
Gumma spleen	...	...	...	1
Tuberculosis spleen	...	...	...	2
Perihepatitis	...	...	...	22
Perisplenitis	...	...	...	58
Infarcts spleen	...	...	...	8
Abscess spleen	...	...	...	2
Suppurative cholecystitis (four with rupture)	...	...	...	14
Suppurative cholangitis	...	...	...	19
Cholelithiasis	...	...	...	30
Peritonitis—acute, localized	...	...	...	2
,, generalized	...	...	...	55
chronic, localized	...	...	...	4
tuberculous	...	...	...	14
Thrombosis splenic vein	...	...	...	1
Hæmorrhagic pancreatitis	...	...	...	1

Neoplasms:—

Primary cancer œsophagus	...	...	...	3
,, stomach	...	...	...	7
,, liver	...	...	...	19
,, cæcum	...	...	...	2
,, large intestine	...	...	...	2
,, tongue	...	...	...	2
,, pancreas	...	...	...	2
,, lip	...	...	...	1
,, cheek	...	...	...	1
Lymphosarcoma duodenum	...	...	...	1
Secondary cancer liver	...	...	...	8
,, spleen	...	...	...	1
,, glands	...	...	...	2
,, intestine	...	...	...	1
,, pancreas	...	...	...	1
Adenoma liver	...	...	...	1
Hæmangioma liver	...	...	...	1

Genito-urinary system:—

Nephritis acute	...	...	...	12
chronic parenchymatous	...	...	...	47
,, interstitial	...	...	...	206
Pyelitis	...	...	...	1
Pyelonephritis	...	...	...	8
Pyonephrosis	...	...	...	3
Hydronephrosis	...	...	...	3
Polycystic kidneys	...	...	...	4
Congenitally small kidney	...	...	...	1
Horseshœ kidney	...	...	...	1
Infarcts kidney	...	...	...	4
Abscesses kidney	...	...	...	3
Tuberculosis kidney	...	...	...	3
Hæmangioma kidney	...	...	...	1
Acute cystitis	...	...	...	9
Strictures urethra	...	...	...	1
Gonorrhœa	...	...	...	3
Tuberculosis testes	...	...	...	2
Hydrocele	...	...	...	8
Ulcerating bubœs	...	...	...	3
Granuloma pudendi	...	...	...	1
Scars penis and groin	...	...	...	162
Hypernephroma	...	...	...	1

External causes.

Asphyxia — drowning	...	...	...	16
hanging	...	...	...	12
foreign body larynx and trachea	...	...	...	1
Poisoning—Mercury	...	...	...	12
Burns	...	...	...	5
Gunshot wounds — Chest	...	...	...	6
Lungs	...	...	...	4
Heart	...	...	...	3
Abdomen	...	...	...	9
Intestines	...	...	...	6
Face and cheek	...	...	...	1
Stomach	...	...	...	1
Skull	...	...	...	2
Brain	...	...	...	1
Limbs	...	...	...	1
Bladder	...	...	...	1
Neck	...	...	...	4
Vertebrae	...	...	...	5
Aorta	...	...	...	2
Kidney	...	...	...	2
Liver	...	...	...	2
Spleen	...	...	...	1
Stab wounds — Chest	...	...	...	5
Lungs	...	...	...	9
Heart	...	...	...	6
Abdomen	...	...	...	5
Stomach	...	...	...	1
Liver	...	...	...	4
Spleen	...	...	...	3
Kidneys	...	...	...	4
Intestines	...	...	...	5

Stab wounds:—

Limbs	...	...	...	1
Face	...	...	...	2
Neck	...	...	...	2
Subclavian artery	...	...	...	1
Inferior vena cava	...	...	...	1

Fractures:—

Skull, base	...	...	...	38
vault	...	...	...	13
Spine	...	...	...	3
Femur	...	...	...	4
Tibia and fibula	...	...	...	3
Pelvis	...	...	...	5
Clavicle	...	...	...	2
Mandible	...	...	...	2
Multiple	...	...	...	1
Seventh cervical vertebra	...	...	...	1
Dislocation elbow	...	...	...	1

Ruptures:—

Spleen	...	...	...	14
Liver	...	...	...	1
Heart	...	...	...	1

Lacerations:—

Brain	...	...	...	...	17
Lungs	...	...	...	...	2

Hæmorrhage:—

Peritoneal sac	...	...	...	...	19
Pleural sacs	...	...	...	...	21
Pericardial sac	...	...	...	...	6
Cerebral	...	...	...	...	4
Subdural	...	...	...	...	41
External	...	...	...	...	5
Into spinal canal	...	...	...	...	2
From middle meningeal artery	...	...	...	...	1

Helminthiasis:—

Ascaris lumbricoides	...	...	...	...	29
Ankylostomiasis	...	...	...	...	36
Trichuris trichiura	...	...	...	...	3
Clonorchis sinensis	...	...	...	...	6
Schistosoma japonicum	...	...	...	...	3

Varied conditions:—

Osteomyelitis	...	...	...	...	1
Status lymphaticus	...	...	...	...	1
Septicaemia	...	...	...	...	50
Psoas abscess	...	...	...	...	4
Cellulitis	...	...	...	...	20
Erysipelas	...	...	...	...	2
Still born	...	...	...	...	13
Gangrene	...	...	...	...	13
Ulcers	...	...	...	...	43
Body too decomposed for examination	...	...	...	...	8
Tetanus	...	...	...	...	5
Transposition of viscera	...	...	...	...	1
Leprosy	...	...	...	...	10
Scoliosis	...	...	...	...	1
Hemiplegia	...	...	...	...	8
Cerebro-spinal meningitis	...	...	...	...	2
Polypi ear	...	...	...	...	1
Parotiditis	...	...	...	...	1
Conjunctivitis	...	...	...	...	1
Sebaceous cyst	...	...	...	...	1
Foamy liver	...	...	...	...	1
Scabies	...	...	...	...	5
Elephantiasis	...	...	...	...	1
Inanition	...	...	...	...	5
Otitis media	...	...	...	...	2
Septic arthritis	...	...	...	...	3
Rheumatoid arthritis	...	...	...	...	1
Tuberculous arthritis	...	...	...	...	2
Tuberculosis femur	...	...	...	...	2
Dilocation hip	...	...	...	...	1

MAIN CAUSES OF DEATH, EXCLUSIVE OF CORONER'S CASES, BY MONTHS.

—	No. of post mortems	Malaria	Tuber- culosis	Lobar pneumonia	Dysentery	Beri-beri	Typhoid	No. of Coroner's Cases	Others
January	...	26	22	15	20	10	4	14	39
February	...	20	29	21	14	9	1	19	27
March	...	18	37	15	15	13	1	24	36
April	...	22	38	30	15	14	4	20	35
May	...	30	29	23	21	15	8	34	47
June	...	28	37	35	20	25	5	27	40
July	...	14	34	14	24	28	3	36	42
August	...	16	34	28	20	17	4	42	35
September	...	24	25	39	24	9	0	37	37
October	...	33	28	34	31	28	4	39	33
November	...	23	30	39	19	15	3	36	33
December	...	34	28	25	10	11	6	22	31
TOTAL	2,232	288	371	318	233	194	43	350	435

CENTRAL MORTUARY, SEPOY, LINES

Total number of post mortem examinations	...	548
Number at which protocols were taken	...	548
Coroner's cases	...	336
Number dying within 24 hours of admission	...	26
Number dying within 48 hours of admission	...	4

Return showing immediate cause of death, exclusive of violence

Beri-beri	...	28
Asiatic cholera	...	6
Plague	...	1
Dysentery—Amœbic	...	5
Bacillary	...	7
Amœbic abscess liver	...	1
Pneumonia — Lobar	...	68
Broncho	...	35
Hypostatic	...	1
Empyema	...	1
Endocarditis — Aortic—chronic	...	5
ulcerative	...	3
Mitral—ulcerative	...	1
Typhoid fever	...	14
Acute cardiac dilatation	...	6
Myocarditis	...	19
Adherent—pericardium	...	1
Aortic (thoracic) aneurysms	...	5
Malaria	...	40
Meningitis	...	11
Neoplasms	...	2
Suppurative peritonitis	...	18
Septic cholangitis	...	2
Pulmonary tuberculosis	...	44
Septicaemia	...	10
Miliary tuberculosis	...	2
Acute enteritis (cause undetermined)	...	1
Cerebral softening	...	2
Tetanus	...	3
Nephritis	...	1
acute	...	1
chronic parenchymatous	...	2
chronic interstitial	...	4
Pyelonephritis	...	7
Acute lymphoid leukæmia	...	1

Dying of diseases referable to systems:—

Alimentary system	...	37
Circulatory system	...	16
Genito-urinary system	...	13
Nervous system	...	11
Respiratory system	...	149

Return showing incidence of diseases:—

Beri-beri	...	...	...	34
Dysentery amoebic—acute	...	...	...	4
„ chronic	...	...	...	3
„ subacute	...	...	...	1
„ bacillary, acute	...	...	...	8
Typhoid fever	...	...	...	16
Malaria—subtertian	...	...	...	48
benign tertian	...	...	...	3
subtertian and benign tertian	...	...	...	1
malarial cachexia	...	...	...	25
Neoplasms — Carcinoma	...	...	...	9
Sarcoma	...	...	...	1
Lympho sarcoma	...	...	...	1
Pneumonia lobar	...	...	...	84
broncho	...	...	...	46
Pulmonary tuberculosis—	...	...	...	62
Cholera	...	...	...	6
Plague	...	...	...	1
Meningitis	...	...	...	17
Tetanus	...	...	...	3

*Return showing systems affected:—**Nervous system—*

Cerebral softening	...	...	...	3
Cerebral hæmorrhage	...	...	...	3
Cerebral thrombosis	...	...	...	2
Cerebral abscess	...	...	...	1
Meningitis — pneumococcic	...	...	...	1
syphilitic	...	...	...	1
tuberculous	...	...	...	9
septic, following trauma	.....	...	...	6
Cerebral syphilis	...	...	...	1
Oedema brain	...	...	...	1
Tuberculous caries spine	...	...	...	1
Hernia cerebri	...	...	...	1
Encephalitis lethargica	...	...	...	1

Circulatory system:—

Acute cardiac dilatation	...	...	...	7
Myocarditis	...	...	...	39
Patent foramen ovale	...	...	...	1
Endocarditis — aortic—chronic	...	...	...	11
ulcerative, acute	...	...	...	6
mitral—ulcerative, acute	...	...	...	4
Pulmonary—ulcerative, acute	...	...	...	1
Pericarditis — pneumococcic	...	...	...	3
tuberculous	...	...	...	1
septic, following trauma	...	...	...	1
adherent pericardium	...	...	...	3
Aneurysmal dilatation thoracic aorta	...	...	...	3
Aneurysms thoracic aorta	...	...	...	10
(4 ruptured: one eroded vertebrae)				
Aneurysms abdominal aorta (ruptured)	...	...	...	1
Aortitis-syphilitic	...	...	...	55
Atheroma	...	...	...	5

Respiratory system:—

Bronchitis	...	...	...	2
Gangrene lung	...	...	...	1
Abscess lung	...	...	...	1
Infarct lung	...	...	...	2
Pleurisy with effusion	...	...	...	7
Empyema	...	...	...	4
Pulmonary collapse	...	...	...	4

Respiratory system—continued.

Acute pleuritis	...	...	...	10
Lobar pneumonia				
Bilateral	...	...	...	43
Right upper lobe	...	...	...	4
Right upper and middle lobes	...	...	...	2
Lobar pneumonia—				
Right middle and lower lobes	...	...	...	4
Right upper and lower lobes	...	...	...	2
Right middle lobe	...	...	...	2
Right lower lobe	...	...	...	14
Entire right lung	...	...	...	1
Left upper lobe	...	...	...	3
Left lower lobe	...	...	...	7
Entire left lung	...	...	...	2
Broncho pneumonia	...	...	...	47
Hypostatic pneumonia	...	...	...	4
Pulmonary tuberculosis — active	...	...	...	54
miliary	...	...	...	8
with haemothorax	...	...	...	2
Oedema glottis	...	...	...	1
Oedema lungs	...	...	...	7
Carcinoma lung	...	...	...	1
Sarcoma, mediastinum, involving sternum	...	...	...	1

Alimentary system—

Ulceration tongue and tonsil	...	...	...	1
Gastric ulcers — chronic	...	...	...	3
chronic, perforated	...	...	...	3
chronic, with acute haemorrhage	...	...	...	1
Duodenal ulcers	...	...	...	3
With perforation	...	...	...	2
Intestinal obstruction	...	...	...	2
Appendicitis, acute	...	...	...	1
Enteritis, acute, cause undetermined	...	...	...	1
Typhoid ulcers — intestine	...	...	...	16
with acute haemorrhage	...	...	...	4
with perforation	...	...	...	4
Dysentery — amoebic, acute	...	...	...	4
„ subacute	...	...	...	1
„ chronic	...	...	...	3
bacillary	...	...	...	8
Tuberculosis intestine	...	...	...	7
Tuberculosis liver	...	...	...	1
Pancreatitis, acute	...	...	...	1
Cirrhosis liver	...	...	...	20
Tuberculosis spleen	...	...	...	1
Perisplenitis	...	...	...	1
Obstructive jaundice	...	...	...	1
Infarct spleen	...	...	...	3
Abscess spleen	...	...	...	2
Suppurative cholecystitis	...	...	...	4
Suppurative cholangitis	...	...	...	2
Cholelithiasis	...	...	...	8
Peritonitis—acute, generalized	...	...	...	20
„ localized	...	...	...	1
tuberculous	...	...	...	3
Neoplasms — carcinoma, oesophagus	...	...	...	2
„ stomach	...	...	...	2
„ colon	...	...	...	2
„ liver (primary)	...	...	...	3
(secondary)	...	...	...	2
carcinoma mesenteric glands, secondary	...	...	...	1
lymphosarcoma colon	...	...	...	1

Genito-urinary system:—

Nephritis — acute	...	...	...	2
chronic parenchymatous	...	...	...	5
chronic interstitial	...	...	...	9
Pyelonephritis	...	...	...	10
Tuberculosis kidney	...	...	...	1
Renal calculi	...	...	...	1
Polycystic kidneys	...	...	...	1
Abscess kidney	...	...	...	1
Cystitis, acute	...	...	...	6
,, chronic	...	...	...	1
,, chronic, tuberculous	...	...	...	2
Gonorrhœa	...	...	...	2
Rupture urethra, with extravasation urine	...	...	...	1
Pregnant uterus	...	...	...	2
Scars penis or groin	...	...	...	5
Mutilation testes	...	...	...	1

External causes:—

Asphyxia, by drowning	...	...	...	9
,, hanging	...	...	...	10
,, strangulation	...	...	...	1
,, aspiration blood	...	...	...	1
Poisoning, by opium	...	...	...	2
,, mercury	...	...	...	1
,, tuba root	...	...	...	1
,, phosphorus	...	...	...	1
,, arsenic	...	...	...	1
Electrocution	...	...	...	3
Burns	...	...	...	1

Gun shot wounds:—

head	...	...	...	6
chest	...	...	...	10
lungs	...	...	...	12
heart	...	...	...	5
abdomen	...	...	...	15
vertebrae	...	...	...	4
carotid	...	...	...	1
internal jugular	...	...	...	1
limbs	...	...	...	1
neck	...	...	...	1

Stab wounds:—

Chest	21
abdomen	20
carotid	2
internal jugular	1
eye	1

Cut throat:—

...	4
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Fractures:—

skull	68
spine	6
ribs	14
sternum	3
humerus	3
femur	4
tibia and fibula	2

Fractures—continued.

pelvis	...	...	...	...	4
clavicle	...	...	...	...	1
mandible	...	...	...	...	2
ulna and radius	...	...	...	...	1
astragalus	...	...	...	...	1
nasal bones	...	...	...	...	1
dislocation axis, with severance spinal cord	...	...	...	...	1

Ruptures:—

spleen	...	...	...	...	24
liver	...	...	...	...	13
heart	...	...	...	...	2
intestines	...	...	...	...	4
mesentery	...	...	...	...	2
kidney	...	...	...	...	1
urethra	...	...	...	...	1

Lacerations:—

Brain	...	...	...	...	16
Lungs	...	...	...	...	3

Hæmorrhage:—

into peritoneal sac	...	...	...	...	21
„ pleural sacs	...	...	...	...	21
„ pericardial sac	...	...	...	...	7
subdural	...	...	...	...	46
extra dural	...	...	...	...	1
cerebral hæmorrhage	...	...	...	...	2
into spinal cord	...	...	...	...	1
during childbirth	...	...	...	...	2

Varied conditions:—

concussion	...	...	...	...	1
tetanus	...	...	...	...	3
septicaemia	...	...	...	...	16
cellulitis limbs	...	...	...	...	3
septic sinus thigh	...	...	...	...	1
tuberculosis glands neck	...	...	...	...	1
gangrene scrotum	...	...	...	...	1
transverse myelitis	...	...	...	...	1
lymphoid leukaemia	...	...	...	...	1
psoas abscess	...	...	...	...	1
abscess parotid gland	...	...	...	...	1
Septic ulcers	...	...	...	...	6
Sprue	...	...	...	...	1
leprosy	...	...	...	...	1
encephalitis lethargica	...	...	...	...	1
cholera	...	...	...	...	6
plague	...	...	...	...	1
transposition viscera	...	...	...	...	1
hernia cerebri	...	...	...	...	1

Helminthiasis:—

Ascaris lumbricoides	...	...	...	...	1
Ankylostomes	...	...	...	...	2
Clonorchis Sinensis	...	...	...	...	3
Tape worm	...	...	...	...	1

TABLE SHOWING MAIN CAUSES OF DEATHS, (EXCLUSIVE OF CORONER'S CASES) BY MONTHS.

—	No. of Autopsies	Malaria	Tuber- culosis	Lobar pneumonia	Beri-beri	Dysentery	Typhoid	Coroner's Cases	Others
January	39	—	2	3	1	—	2	28	3
February	29	—	1	—	—	1	—	16	11
March	36	—	—	3	1	1	1	27	3
April	45	2	2	2	1	1	—	29	8
May	47	4	5	3	3	1	—	23	8
June	50	2	5	6	4	2	3	21	7
July	62	3	6	2	4	1	4	28	14
August	48	5	1	2	—	1	2	31	6
September	53	3	3	4	1	1	—	32	9
October	45	4	2	3	—	—	—	33	3
November	47	2	—	3	—	—	1	35	6
December	47	1	3	4	1	1	—	33	4
Total	548	26	30	35	16	10	13	336	82

TABLE SHOWING MAIN CAUSES OF DEATH, AS FOUND AT POST MORTEM EXAMINATION, DURING 1926 AND 1927, WITH PERCENTAGES.

1926	No. of Autopsies	Malaria	Tuberculosis	Lobar pneumonia	Dysentery	Beri-beri	Typhoid	Coroner's Cases
Tan Tock Seng Mortuary ...	1872	230 or 17.5%	162 or 12.3%	152 or 11.7%	145 or 11.1%	79 or 6%	17 or 1.3%	201 or 15.3%
Central Mortuary ...	392	33 or 8.4%	20 or 5.1%	31 or 7.9%	10 or 2.6%	28 or 7.1%	13 or 3.3%	221 or 56.4%
								118
1927	2232	326 or 14.5%	380 or 17%	342 or 15.3%	246 or 11%	209 or 9.4%	46 or 2.1%	350 or 15.7%
Tan Tock Seng ...	548	40 or 7.3%	46 or 8.4%	68 or 12.4%	12 or 2.2%	28 or 5.1%	14 or 2.5%	336 or 61.6%
Central Mortuary ...								

Report on post mortem examination of Coroner's cases for 1927.

Total number	...	...	...	...	686
Males	...	...	...	...	648
Females	...	...	...	...	38
Adults	...	...	...	...	626
Children (under 15)	...	...	...	...	60
Nationality—Europeans	...	...	...	...	5
Chinese	...	...	...	...	572
Indians	...	...	...	...	80
Others	...	...	...	...	29

CASES DYING AS THE RESULT OF BULLET WOUNDS

<i>No.</i>	<i>Where hit</i>	<i>Damage caused</i>	<i>No. of Wounds</i>	<i>Remarks</i>
1.	Skull	Fracture skull with sub-dural hæmorrhage and laceration brain	3	
2.	Front chest	Heart and lungs penetrated, with hæmorrhage	1	
3.	Sternum	Lungs penetrated, with hæmorrhage	1	
4.	Neck and chest	Terminal lobar pneumonia	2	
5.	Abdomen	Gut perforated, and bladder penetrated	2	Shock.
6.	Face and cheek	Fracture mandible and antrum of Highmore	1	
7.	Front chest and right arm	Lung, kidney (right) and gut penetrated	2	
8.	Back chest and thigh	Lung penetrated, with hæmorrhage	2	Five stab wounds also.
9.	Back chest and front and back abdomen	Liver perforated, lungs lacerated, with internal hæmorrhage vertebra penetrated	4	
10.	Front and back of chest, back of abdomen and thigh	Aorta torn, lungs lacerated, with internal hæmorrhage, and fracture femur	20	
11.	Front chest	To lt. kidney, spleen and transverse colon, with hæmorrhage	1	
12.	Front and back chest	Heart, aorta and lung perforated, with hæmorrhage	4	
13.	Abdomen	Liver perforated, aorta torn with hæmorrhage	1	
14.	Abdomen and thigh	Cæcum and small intestine perforated, with hæmorrhage	4	
15.	Front chest	Heart penetrated, with hæmorrhage	5	
16.	Neck	Oedema lungs, and acute cardiac dilatation, following gun shot wound neck	1	

<i>No.</i>	<i>Where hit</i>	<i>Damage caused</i>	<i>No. of Wounds</i>	<i>Remarks</i>
17.	Left frontal area ...	Fracture vault of skull, laceration brain, and subdural hæmorrhage ...	1	
18.	Abdomen ...	Multiple perforations of gut with injury to vertebra ...	1	
19.	Abdomen ...	Stomach, intestine and mesentery perforated, bullet lodged in vertebra ...	1	
20.	Vertebra and jaw ...	Mandible broken, with paraplegia from bullet lodging in 8th. dorsal vertebra, and causing hæmorrhage into spinal canal ...	2	
21.	Back chest ...	Lungs and aorta penetrated, with hæmorrhage ...	3	
22.	Skull ...	Laceration brain and subdural hæmorrhage ...	1	
23.	Neck and front chest	Died of Broncho Pneumonia	2	
24.	Head and chest front	Fracture skull and hæmothorax ...	2	
25.	Abdomen ...	Inferior vena cava severed	1	
26.	Leg ...	Compound fracture right leg with shock ...	1	
27.	Cheek ...	Fracture skull, subdural hæmorrhage ...	1	
28.	Front chest ...	Heart and lungs penetrated, with hæmorrhage ...	1	
29.	Abdomen and arm ...	Gut perforated, with hæmorrhage. Fracture ulna and radius ...	1	
30.	Neck ...	Internal jugular and carotid severed ...	3	
31.	Neck ...	Lt. internal jugular and carotid injured ...	1	
32.	Front chest ...	Liver, spleen and left lung penetrated ...	1	
33.	Front chest ...	Lung injured, with hæmorrhage ...	3	
34.	Front chest ...	Heart and lung, liver and vertebra injured ...	2	
35.	Back chest and thigh	Lung lacerated, with hæmothorax ...	2	
36.	Front chest ...	Stomach and spleen penetrated, with hæmorrhage	2	
37.	Buttock ...	Small intestine and bladder perforated ...	1	
38.	Front chest ...	Multiple abscesses kidneys	1	
39.	Front chest ...	Heart and lungs penetrated, with hæmorrhage ...	1	
40.	Front chest ...	Lung and aorta penetrated, with hæmorrhage ...	2	
41.	Front chest and abdomen ...	Stomach, liver, spleen penetrated ...	2	

<i>No.</i>	<i>Where hit</i>	<i>Damage caused</i>	<i>No. of Wounds</i>	<i>Remarks</i>
42.	Back chest	... Several spinal cord, with septicæmia from cystitis and suppurative nephritis	1	
43.	Head	... Fracture skull with laceration brain ...	1	
44.	Chest front	... Lung and aorta injured ...	1	One stab wound.
45.	Chest back	... Lung and right kidney penetrated ...	1	
46.	Front chest	... Lung, heart and liver injured ...	2	
47.	Vertebra	... Terminal pneumonia after paralysis below umbilicus	1	Three stab wounds.
48.	Abdomen	... Gut perforated with generalised peritonitis ...	1	

CASES DYING AS THE RESULT OF STAB WOUNDS

<i>No.</i>	<i>Where stabbed</i>	<i>Tissues involved</i>	<i>No. of Wounds</i>	<i>Remarks</i>
1.	Front chest	... Heart and lungs penetrated	Multiple.	
2.	Abdomen	... Gut penetrated, with shock and hæmorrhage ...	3	
3.	Front chest	... Heart and lung penetrated	3	
		Small gut penetrated; left common iliac artery severed ...	7	
5.	Abdomen and arms	... Kidney and spleen penetrated ...	10	
6.	Front chest	... Lung, pericardium and spleen injured ...	1	
7.	Front chest	... Lung with hæmothorax ...	3	
8.	Abdomen and neck	... Hæmorrhage ...	2	Suicidal
9.	Front chest	... Aorta wounded ...	3	
10.	Neck	... Left common carotoid and left lung injured ...	1	
11.	Abdomen	... Stomach penetrated, with general peritonitis ...	1	
12.	Front chest and arm	... Lung injured, with resulting lobar pneumonia ...	5	
13.	Back chest	... Lungs injured, with hæmorrhage ...	1	
14.	Abdomen	... Gut perforated, with generalized peritonitis ...	1	
15.	Front chest	... Heart and lungs penetrated	12	
16.	Abdomen	... Gut penetrated and liver wounded, with hæmorrhage ...	3	
17.	Back chest	... Stomach and spleen injured with hæmorrhage ...	2	
18.	Abdomen	... Liver injured, with severe hæmorrhage ...	1	
19.	Multiple	... Right lung punctured, with hæmorrhage ...	32	
20.	Back chest	... Lung and spleen injured, with terminal pneumonia	1	

<i>No.</i>	<i>Where stabbed</i>	<i>Tissues involved</i>	<i>No. of Wounds</i>	<i>Remarks</i>
21.	Abdomen ...	Stomach, liver, jejunum, abdominal aorta and left kidney injured ...	1	
22.	Front chest ...	Heart and lungs penetrated, with hæmorrhage ...	1	
23.	Front chest ...	Left lung, spleen and stomach injured ...	1	
24.	Front chest and abdomen ...	Heart, lungs, and spleen injured ...	5	
25.	Abdomen ...	Septic peritonitis ...	5	
26.	Neck, abdomen and limbs ...	Vessels neck severed, and left kidney injured ...	23	
27.	Arm, front chest ...	Fracture ribs, and rupture kidney ...	3	
28.	Front and back chest	Lungs injured with hæmothorax ...	7	
29.	Back chest ...	Heart and lungs injured, with hæmorrhage ...	1	
30.	Chest and abdomen ...	Heart and spleen injured, with hæmorrhage, colon wounded ...	9	
31.	Sternum ...	Heart and lungs wounded, with hæmorrhage ...	4	
32.	Abdomen ...	Gut and mesentery wounded	2	
33.	Face, neck, abdomen	Vessels neck severed, liver injured with hæmorrhage	17	
34.	Front chest ...	Lung and left ventricle injured ...	3	
35.	Chest, abdomen, arms	Liver, spleen, gut, lung injured ...	12	
36.	Back chest, face ...	Inferior vena cava severed	2	
37.	Back chest, loin ...	Lung injured, with hæmorrhage ...	2	
38.	Left supraclavicular region ...	Left subclavian artery severed ...	1	
39.	Abdomen ...	Punctured gut, with acute cardiac dilatation ...	3	
40.	Abdomen ...	Colon punctured, with hæmorrhage ...	1	
41.	Abdomen front chest	Gut perforated and lung injured with hæmorrhage	7	
42.	Abdomen ...	Gut protruded, and punctured, with hæmorrhage	3	Peritonitis.
43.	Left front chest ...	Hæmothorax, with resulting lobar pneumonia ...	1	
44.	Front chest and abdomen ...	Liver, gut, stomach and lung injured ...	8	
45.	Left loin and arms ...	Left kidney penetrated, with hæmorrhage ...	5	
46.	Back chest ...	Lung and kidney (left) penetrated, with hæmorrhage ...	8	

<i>No.</i>	<i>Where stabbed</i>	<i>Tissues involved</i>	<i>No. of Wounds</i>	<i>Remarks</i>
47.	Front chest and arm	Right ventricle penetrated	2	
48.	Abdomen	Spleen cut, stomach and colon cut	1	
49.	Front chest	Lung and liver penetrated, with hæmorrhage	2	
50.	Back chest and thigh	Lung penetrated, with hæmorrhage	5	
51.	Front chest and arm	Left ventricle cut, with hæmorrhages. Kidney cut	3	
52.	Front chest	Lungs and pulmonary artery cut, with hæmorrhage	1	
53.	File into eye	Brain injured, with hæmorrhage	1	

CASES DYING AS THE RESULT OF INJURIES RECEIVED FROM VEHICLES.

<i>No.</i>	<i>Damage caused</i>
1.	Fracture base of skull, with subdural hæmorrhage.
2.	Fracture base of skull, with subdural hæmorrhage, and laceration brain.
3.	Fracture pelvis, with shock and hæmorrhage.
4.	Fracture base of skull, with subdural hæmorrhage, and laceration brain.
5.	Fracture ribs, forearm, and skull, with ruptured spleen and liver.
6.	Fracture skull, and ruptured spleen, with hæmorrhage.
7.	Fracture base of skull, with subdural hæmorrhage.
8.	Fracture base of skull, with subdural and extradural hæmorrhage.
9.	Fracture base of skull, with subdural hæmorrhage, and laceration brain.
10.	Subdural hæmorrhage.
11.	Subdural hæmorrhage.
12.	Fracture base of skull, with subdural and extradural hæmorrhage.
13.	Fracture base of skull, with subdural hæmorrhage.
14.	Fracture base of skull, with subdural hæmorrhage.
15.	Fracture base of skull, with subdural and extradural hæmorrhage, and fracture ribs.
16.	Sapræmia—cellulitis right thigh, knee and leg.
17.	Septicæmia—gangrene foot and leg.
18.	Rupture liver, fracture ribs and contusion lungs, with hæmorrhage.
19.	Rupture spleen, and intraperitoneal hæmorrhage.
20.	Fracture base of skull, and cerebral hæmorrhage.
21.	Fracture ribs, with laceration lungs, and hæmothorax.
22.	Sapræmia—gangrene leg.
23.	Crushed skull, with hæmorrhage; fracture ribs and clavicle.
24.	Fracture skull, with subdural hæmorrhage, and laceration brain.
25.	Laceration brain, with extra and subdural hæmorrhage.
26.	Fracture pelvis, with hæmorrhage.
27.	Subdural hæmorrhage, with laceration brain, and right hæmothorax from laceration lung from fractured ribs.
28.	Rupture gut, with internal hæmorrhage, and fracture spine.
29.	Fracture base of skull, with subdural hæmorrhage.
30.	Fracture vault and base of skull, with laceration brain.
31.	Fracture base of skull, with subdural hæmorrhage.
32.	Fracture base of skull, with subdural hæmorrhage.
33.	Fracture vault and base of skull, with subdural hæmorrhage.
34.	Rupture pedicle of spleen, with shock and hæmorrhage.
35.	Fracture vault of skull, with laceration and hæmorrhage brain, fracture femur, chest crushed with rupture heart and lungs.

<i>No.</i>	<i>Damage caused</i>
36.	Fracture vault and base of skull, with subdural hæmorrhage.
37.	Fracture base of skull, with subdural hæmorrhage.
38.	Fracture 7th, cervical vertebræ, with hæmorrhage into spinal canal.
39.	Fracture base skull, with subdural hæmorrhage; fracture right tibia and fibula.
40.	Fracture vault and base of skull, with subdural hæmorrhage, and terminal pneumonia.
41.	Fracture vault and base of skull, with subdural hæmorrhage; Rupture spleen, and fracture clavicle and right femur.
42.	Fracture base of skull, with subdural hæmorrhage—fracture ribs.
43.	Fracture base of skull, with subdural hæmorrhage.
44.	Cerebral softening following injury to blood vessels of right temporal lobe.
45.	Rupture spleen with internal hæmorrhage.
46.	Fracture femur and pelvis with laceration of tissues around.
47.	Fracture base of skull, with subdural hæmorrhage, fracture right tibia and fibula.
48.	Fracture base of skull, with extra and subdural hæmorrhage, and laceration brain and fracture ribs.
49.	Fracture base of skull, with subdural hæmorrhage, and laceration brain, and fracture ribs.
50.	Fracture base of skull, with subdural hæmorrhage, and laceration brain.
51.	Fracture skull, with subdural hæmorrhage, and laceration brain.
52.	Fracture of skull, with cerebral softening and hæmorrhage.
53.	Fracture dislocation 7th, cervical vertebra, fracture ribs, and hæmothorax.
54.	Fracture femur with sepsis.
55.	Hæmopericardium and subdural hæmorrhage.
56.	Fracture skull, with subdural hæmorrhage, and laceration brain.
57.	Rupture liver and spleen, with internal hæmorrhage.
58.	Fracture base of skull, with subdural hæmorrhage.
59.	Fracture skull and fracture ribs.
60.	Fracture ribs, rupture spleen, laceration lungs and internal hæmorrhage.
61.	Cerebral hæmorrhage from concussion, and right hæmothorax.
62.	Fracture left femur, with shock and hæmorrhage.
63.	Fracture base of skull, with subdural hæmorrhage.
64.	Fracture base of skull, and rupture spleen.
65.	Fracture ribs with hæmothorax.
66.	Fracture base of skull, with subdural hæmorrhage.
67.	Rupture spleen and liver with internal hæmorrhage; fracture ribs.
68.	Fracture base of skull, with subdural hæmorrhage, and laceration brain.
69.	Rupture spleen, with internal hæmorrhage.
70.	Fracture humerus, sternum and ribs; rupture heart, spleen and liver.
71.	Rupture spleen, with internal hæmorrhage.
72.	Fracture base of skull, with purulent meningitis and abscess right temporal lobe.
73.	Rupture liver with internal hæmorrhage.
74.	Rupture spleen and small intestine with fracture sternum.
75.	Fracture ribs, with rupture spleen and internal hæmorrhage.
76.	Rupture spleen, with internal hæmorrhage.
77.	Dislocation axis, with severance of spinal cord rupture liver.
78.	Fracture base of skull, with subdural hæmorrhage.
79.	Fracture ribs, with laceration lungs, and rupture liver and spleen.
80.	Fracture base of skull, with pontine hæmorrhage.
81.	Fracture base of skull, with subdural hæmorrhage; rupture spleen.
82.	Fracture base of skull, with subdural hæmorrhage.
83.	Fracture ribs, rupture heart, rupture spleen and liver.
84.	Fracture base of skull, with subdural hæmorrhage.

<i>No.</i>	<i>Damage caused</i>
85.	Fracture base of skull, with subdural hæmorrhage.
86.	Fracture base and vault of skull, with subdural hæmorrhage and laceration brain.
87.	Fracture pelvis, with shock and hæmorrhage.
88.	Fracture skull, with subdural hæmorrhage.
89.	Fracture base of skull, with subdural hæmorrhage, and laceration brain.
90.	External hæmorrhage from severance of right internal carotid and jugular vein.
91.	Rupture mesentery, with shock and hæmorrhage.
92.	Rupture liver and spleen; fracture base of skull.
93.	Fracture vault and base of skull, with subdural hæmorrhage.
94.	Fracture vault and base of skull, with subdural hæmorrhage.
95.	Rupture spleen, kidney, liver and mesentery, with internal hæmorrhage.
96.	Fracture vault and base of skull, with subdural hæmorrhage.
97.	Bilateral broncho pneumonia, with fracture base of skull, and subdural hæmorrhage.

CASES DYING AS THE RESULT OF INJURIES FROM BLUNT INSTRUMENTS.

<i>No.</i>	<i>Damage caused</i>
1.	Fracture skull, with cerebral laceration.
2.	Fracture base of skull and vault, with subdural hæmorrhage.
3.	Fracture base of skull, with subdural hæmorrhage.
4.	Septic meningitis following wound frontal lobe.
5.	Septic meningitis following wound left frontal lobe.
6.	Fracture vault and base of skull, with subdural hæmorrhage.
7.	Subdural hæmorrhage.
8.	Rupture spleen, with internal hæmorrhage.
9.	Fracture base of skull, with extra and subdural hæmorrhage.
10.	Chronic traumatic meningitis, following fracture skull, with hernia cerebri and laceration brain.
11.	Fracture base of skull, with subdural hæmorrhage.

CASES DYING FROM INJURIES RECEIVED FROM FALLS, ETC.

<i>No.</i>	<i>Cause</i>	<i>Damage caused</i>
1.	Wood fell on skull ...	Fracture skull, with subdural hæmorrhage.
2.	Fall ...	Tetanus.
3.	Box fell on leg ...	Shock and hæmorrhage—fracture fibula and laceration of tissues around.
4.	Fall from house top	Fracture pelvis, femur and ribs, rupture liver, and subdural hæmorrhage.
5.	Fall ...	Fracture vault and base of skull, with subdural hæmorrhage.
6.	Fall from tree ...	Fracture base of skull, with subdural hæmorrhage.
7.	Fall ...	Fracture base of skull, with subdural hæmorrhage and laceration brain.
8.	? ...	Fracture base of skull, with subdural hæmorrhage.
9.	? ...	Rupture spleen with internal hæmorrhage.
10.	? ...	" " " " "
11.	? ...	" " " " "
12.	? ...	" " " " "
13.	? ...	" " " " "
14.	? ...	" " " " "
15.	Log fell on face ...	Fracture base of skull, with subdural hæmorrhage, and fracture jaw.
16.	Axe fell on knee ...	Septic arthritis.

<i>No.</i>	<i>Cause</i>	<i>Damage caused</i>
17.	Fall down quarry ...	Fracture base and vault of skull, with subdural hæmorrhage.
18.	Fall from roof ...	Fracture base of skull, with subdural hæmorrhage.
19.	Fall into stone quarry	Fracture ribs, with hæmothorax—fracture right tibia and fibula.
20.	Fall out of bed ...	Internal hæmorrhage—partial separation of placenta.
21.	Fall over verandah ...	Rupture spleen, with internal hæmorrhage.
22.	Fall ...	Fracture skull, with laceration brain and rupture spleen.
23.	Fall ...	Rupture spleen, with internal hæmorrhage.
24.	Fall ...	Fracture base of skull, with subdural hæmorrhage.
25.	Fall ...	Fracture base of skull with septic meningitis.
26.	Fall ...	Fracture base of skull, with subdural hæmorrhage.
27.	Fall ...	Accidental uterine hæmorrhage.
28.	Fall ...	Fracture base of skull, with subdural hæmorrhage.
29.	Fall ...	Cerebral hæmorrhage.
30.	Fall ...	Fracture skull, with cerebral hæmorrhage.
31.	Fall ...	Fracture base of skull, with subdural hæmorrhage.
32.	? ...	Rupture spleen, with internal hæmorrhage.
33.	Fall ...	Fracture base of skull, with rupture spleen.
34.	Fall ...	Fracture base of skull, with extradural hæmorrhage.
35.	Fall ...	Fracture jaw with asphyxia from drowning.
36.	Fall ...	Rupture spleen, with internal hæmorrhage.
37.	Fall ...	Fracture cervical vertebra (5 and 6) with fracture ribs.
38.	Fall ...	Fracture femur and hypostatic pneumonia.
39.	Fall ...	Fracture spine, with resulting ascending infection of kidneys (pyelonephritis and cystitis).
40.	Beam fell on throat ..	Lobar pneumonia, following injury to larynx and descending infection.
41.	Fall ...	Hypostatic pneumonia following fracture base of skull.
42.	Fall ...	Fracture dislocation 12th, dorsal vertebra.
43.	Fall ...	Fracture skull with subdural hæmorrhage.
44.	Fall ...	Fracture ribs, humerus with lobar pneumonia.
45.	Fall ...	Fracture base of skull, with subdural hæmorrhage.
46.	Fall ...	Fracture right tibia and fibula, fracture pelvis, fracture nasal bones with hæmorrhage.
47.	Fall ...	General peritonitis—rupture ileum with fracture spine, sternum, pelvis and astragalus.
48.	Fall ...	Fracture base of skull, with subdural hæmorrhage.
49.	Fall ...	Fracture base of skull, with subdural hæmorrhage.
50.	Fall ...	Fracture vault and base of skull; rupture liver.
51.	Fall ...	Rupture cerebral vessels; rupture liver with hæmorrhage.
52.	Fall ...	Fracture base of skull and rupture spleen.
53.	Boxes fell on him ...	Subdural hæmorrhage with rupture cortical vessels.

<i>No.</i>	<i>Cause</i>	<i>Damage caused</i>
54.	Fall ...	... Fracture spine with terminal lobar pneumonia.
55.	Fall, astride ...	... Sapræmia—gangrene scrotum, from rupture urethra and extravasation of urine.
56.	Fall ...	... Fracture base of skull, with subdural hæmorrhage.
57.	Fall ...	... Sapræmia—compound Colles, fracture and fracture lower jaw with septic wound chin.
58.	Fall ...	... Fracture vault and base of skull, with subdural hæmorrhage.
59.	Rubber machine accident ...	... Sapræmia—following infection legs and arm.
60.	Fall ...	... Fracture base of skull, with subdural hæmorrhage and laceration brain.
61.	Fall ...	... Fracture base and vault of skull with subdural hæmorrhage and laceration brain.
62.	Fall ...	... Fracture and vault of skull with subdural hæmorrhage and laceration brain; rupture spleen and left kidney; Colles fracture and fracture ribs.
63.	Fall ...	... Fracture vault and base of skull, with subdural hæmorrhage and laceration brain, rupture liver.
64.	Spar fell on him ...	... Rupture liver and fracture ribs, with internal hæmorrhage.
65.	Crushed in a sampan (rowing boat) ...	... Fracture dislocation 4 and 5 Lumbar and 1st, sacral vertebra with terminal lobar pneumonia.
66.	Fall ...	... Fracture vault and base of skull, with subdural hæmorrhage and laceration brain.
67.	Fall ...	... Fracture base and vault of skull, with subdural hæmorrhage and laceration brain.

CASES DYING FROM POISONS.

Opium	...	...	...	...	3
Phosphorus	...	...	...	...	1
Mercury	...	...	...	...	2
Tuba root	...	...	...	...	1
Arsenic	...	...	...	...	1
Total					8

Asphyxia.—

Hanging	...	...	...	...	20
Drowning	...	...	...	...	23
Strangulation	...	...	...	...	1
Aspirating food into trachea	...	...	...	...	1
Total					45

Cut Throats.—

Burns	...	...	...	...	4
Electrocution	...	...	...	...	6
Still borns	...	...	...	...	3
Bodies too decomposed	...	...	...	...	9
	...	...	...	...	10

Abnormalities.—Transposition of Viscera ... 2

<i>Mutilation.</i> —Scrotum and tests pulped with a hammer, with injury and contusions of chest, and fracture ribs	1
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Exhumations.— ... 1

<i>Other causes of deaths.</i> —	319
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Remarks.—1927 has been a record year for the number of post-mortem examinations. The main causes of death have been very much the same as in 1926, but the actual number of cases has increased very much. Lobar pneumonia shows an increase, rising from about 11 per cent to over 15 per cent. Malaria shows a moderate decrease.

The number of Coroner's cases shows such a marked increase that it has seemed advisable to make a separate report on them. The number has increased from 422 in 1926 (an unusually high number) to 686 in 1927.

The number of histological sections has increased enormously, from 148 in 1926 to 303 in 1927.

Staff.—Dr. C. SUBRAHMANYAN was transferred to the Penang Branch on June 1st, and his place taken here by Dr. L. S. DA SILVA. Both these assistants have done excellent work in 1927.

The laboratory assistants have done good work, and responded willingly to the large increase in the amount of work required of them.

II. PENANG

REPORT BY J. A. COWAN, M.B., B.S., *Government Pathologist, Penang.*

	1926	1927
<i>Blood Films.</i> —Total number examined ...	14,875	15,905
Positive to Subtertian Malaria ...	2,078	2,145
Positive to Benion tertian Malaria ...	635	722
Positive to Quartan Malaria ...	60	37
<i>Stools.</i> —Total examined microscopically ...	13,843	15,532
Positive to ankylostome ova ...	5,494	4,567
Positive to entamœbæ histolytica ...	142	160
Total number examined culturally ...	854	871
Positive to b. typhosus ...	2	2
Positive to b. dysenteriae (shioa) ...	3	3
Positive to b. dysenteriae (flexnor) ...	20	19
Positive to salmonella ...	29	13
<i>Urine.</i> —General examinations ...	14,007	14,136
Estimations of albumin ...	93	36
Estimations of sugar ...	21	42
Cultural examinations ...	94	84
<i>Sputum.</i> —Total number examined ...	1,400	2,024
Positive to b. tuberculosis ...	336	318
<i>Films for Gonococci.</i> —Total ...	669	620
Positive ...	292	285
<i>Films for B. Lepræ.</i> —Total ...	340	274
Positive ...	146	76
<i>Films for B. Diptheriæ.</i> —Total ...	81	19
Positive ...	15	1
<i>Cultures for B. Diptheriæ.</i> —		
Positive ...	32	19
<i>Films for other organisms.</i> —		
Positive ...	15	1
<i>Films for other organisms.</i> —	2,651	1,461
<i>Dark ground examinations for Spirochete</i>		
<i>Pallida.</i> — ...	136	143
Positive ...	39	51
<i>Blood cultures</i> ...	26	76
<i>Other cultures</i> ...	1,072	138
<i>Blood counts</i> ...	105	374
<i>Blood chemical examinations</i> ...	13	65

	1926	1927
<i>Widals.</i> —Positive to <i>B. typhosus</i> ...	61	82
Positive to <i>B. typhosus</i> ...	7	9
Positive to para. A. ...	1	2
Positive to para. B. ...	1	3
Positive to para. C. ...	—	—
<i>Weil felix reactions</i> ...	—	10
Positive ...	—	—
<i>Wassermann Reactions</i> ...	3,502	3,610
Positive ...	1,667	1,447
<i>Complement fixation tests</i> ...	8	24
<i>Hgglutination tests for organisms</i> ...	35	46
<i>Sections</i> ...	38	34
<i>Bacteriological examinations of water</i> ...	47	63
<i>Vaccine prepared</i> ...	38	26
<i>Cerebro spinal fluid general examinations</i> ...	—	39
<i>Cerebro spinal fluid Lange tests</i> ...	—	6
<i>Other examinations</i> ...	—	97
<i>Post mortem examinations</i> ...	539	442
Total ...	54,633	56,298

1. The small branch laboratory at the General Hospital was re-opened on 1st December, 1927, for clinical side room work relieving the strain on the accommodation at the main laboratory.

2. Dr. J. A. COWAN has been in charge throughout the year.

III. MALACCA.

REPORT BY J. R. JACOB, L.M.S. (SINGAPORE), *Assistant Surgeon Pathologist, Malacca.*

1. Total number of specimens examined	...	...	13,680
2. Bloods counts—total	...	...	8
differential	...	...	48
3. Blood films for filaria	...	...	2
4. Blood films for malaria	...	...	3,379
Positive to S.T. Malaria	...	801	
,, ,, and B.T. Malaria	...	81	
,, ,, and Quartan Malaria	...	2	
,, ,, B.T. and Quartan	...	1	
,, ,, B.T. Malaria	...	363	
,, ,, and Quartan	...	6	
,, ,, Quartan Malaria	...	62	
5. Cultures from blood	...	...	4
,, for diphtheria	...	...	52
,, positive to diphtheria	...	7	
,, for Gonococci	...	...	1
,, ,, Leptospira	...	...	2
,, ,, Meningocci	...	...	12
,, from Stools	...	...	8
,, ,, Urine	...	...	4

6.	Estimation of Hæmoglobin	...	...	...	2
7.	Films for Anthrax	...	...	...	3
	„ „ Positive	...	...	1	
	„ „ Gonococci	...	...	...	317
	„ „ Positive	...	...	54	
	„ „ B. Lepræ	...	...	...	63
	„ „ Positive	...	...	19	
	„ „ Leptospira	...	...	...	4
	„ „ Mycetoma	...	...	...	4
	„ „ T. Pallida	...	...	...	2
8.	Identification of worms	...	...	...	2
9.	Inoculation of animal	...	...	...	1
10.	Medico-legal exhibits for blood and Senrinal Stains	...	...	...	13
11.	Milk Analysis	...	...	...	2
12.	Sections	...	...	...	15
13.	Sputum	...	...	...	898
	Positive to B. Tuberculosis	...	...	141	
	„ „ Pneumococci	...	...	19	
14.	Stools for ova	...	...	...	4,647
	Ankylostoma ova	...	...	919	
	„ „ and roundworm ova	...	...	162	
	„ „ „ and whipworm ova	...	...	987	
	Roundworm ova	...	...	127	
	„ „ and whipworm ova	...	...	233	
	Whipworm ova	...	...	588	
15.	Stools for Amœbæ	...	...	...	455
	„ „ Positive	...	...	74	
16.	Stools for occult blood	...	...	...	15
	„ „ Positive	...	...	6	
17.	Stools for B. Tuberculosis	...	...	...	10
	„ „ Positive	...	...	1	
18.	Stools for V. Cholerae	...	...	...	5
19.	Urines Chemical and Microscopical	...	...	...	2,891
20.	Urines Estimations of Sugar	...	...	...	21
21.	Wasserman Reactions	...	...	...	756
	„ „ Positive	...	...	374	
22.	Water Examinations	...	...	...	13
23.	Widals	...	...	...	21
Total for year					13,680

Staff.—It is with regret that I have to record the death on the 8th of February, 1927, of Dr. S. N. BARDHAN, Deputy Pathologist, Malacca, from diabetes.

Assistant Surgeon J. R. JACOB from the Pathological Branch, Penang, has been in charge of the Laboratory since 9th June, 1927.

Laboratory Assistant L. C. MITRA has been doing very creditable work this year.

APPENDIX "D"

GOVERNMENT ANALYSTS' BRANCH

I.—SINGAPORE

REPORT BY J. C. COWAP, B.Sc., F.I.C., *Government Analyst, S. S.*

The work of this Department consists of general chemical investigations and analyses required by the Government for the Settlements of Singapore and Malacca.

In addition work is received from commercial firms and the Governments of Johore, Kelantan and Trengganu.

The great bulk of analyses undertaken are on behalf of the Medical, Monopolies and Police Departments of the Colony.

(A) MEDICAL DEPARTMENT

Chemical work is performed for the Health Branch of the Medical Department and for the Hospitals.

The samples submitted are chiefly:—

- (1) Water.
- (2) Specimens for Toxicological Analyses.
- (3) Clinical specimens.
- (4) Milk.

(1) *Water*.—Fifty-three samples were submitted by the Health Department. These were in general drinking waters taken from wells on Estates, at Police Stations, Schools, etc., but 4 samples were taken from Factory effluents.

(2) *Toxicological Analyses*.—

(a) Thirty specimens of stomach contents, washings, etc., were received from the Hospitals. Of these 7 contained opium, 4 contained atropine, 4 lead, 2 phosphorus, 2 veronal, 4 strong alkali, 1 oxalic acid and 1 arsenic. In 5 cases no poison was discovered.

(b) Eighteen specimens of viscera of persons suspected to have died from poison were sent in by the Government Pathologist.

Of these 5 contained opium, 3 mercury, and 1 each phosphorus, acetic acid, arsenic and tuba root.

(c) Seven samples of drugs and other matters connected with cases of suspected poisoning were received from the Hospitals.

(3) *Clinical Specimens*.—Thirty-one samples of urine were sent in by the General Hospital for determination of urea, sugar, acetone, etc. Sixteen Test-meal samples and 1 calculus were received from the same source.

(4) *Milk*.—Eight samples of fresh milk were analysed for the General Hospital and 4 samples of condensed milk were examined for the Medical Department under the "Sale of Food and Drugs" Ordinance.

(5) Samples of Paris Green were also analysed in connection with Health Department mosquito larvicide experiments.

(B) MONOPOLIES DEPARTMENT

The work done for the Monopolies Department may be divided into that which concerns:—

- (1) Opium, Chandu and Chandu Dross.
- (2) Liquors.
- (3) Deleterious Drugs.

(1) *Opium and Chandu*.—Reports were issued to the Monopolies Department on exhibits in 73 prosecutions instituted under the Chandu Revenue Ordinance.

Assays were made on 52 check samples of chandu received from the Opium Factory and 64 samples of chandu seized by the Preventive Service.

Analyses were made on 54 samples of opium purchased by the Monopolies Department for the manufacture of chandu.

Chandu Dross.—Twenty-eight thousand eight hundred and eight packets weighing 85,450 tahils of chandu dross were weighed and valued on purchase from smokers or on return from Government Smoking Shops. This involved the making of 2,900 actual morphine assays.

Two investigations were made on forged wrappers for chandu packets.

(2) *Liquors*.—

(a) Determinations of spirit strength were made for purposes of duty on 1,615 samples of liquor on importation into Singapore and on 73 samples on importation into Malacca.

(b) Seventy-one samples of Brandy were analysed for purposes of classification under the Liquors Revenue Ordinance.

Of these 60 were passed as genuine.

(c) Twenty-four reports were made on exhibits in illicit liquor cases.

(d) One hundred and ninety-four samples of toddy were analysed for purity and 15 samples of other liquors.

(e) Twenty-eight consignments of arrack were methylated, the total volume of spirit being 165,000 gallons.

One of these consignments was methylated with a special mixture in order to render the spirit fit for use in a newly established soap making industry.

(3) *Deleterious Drugs*.—Exhibits in 7 cases of the suspected importation of deleterious drugs and bhang were examined. The chief drug of this kind imported is cocaine hydrochloride.

(C) POLICE DEPARTMENT

Work for the Police is generally undertaken in connection with police prosecutions or investigations. It is shown under various headings below:—

(1) *Toxicological*.—Eleven exhibits were examined in 4 cases of suspected poisoning. The poisons found were atropine (2 cases), strychnine, opium, yohimbine and nitric acid. One bottle of medicine was found to consist of tuba root.

(2) *Liquors*.—Thirty-five samples of liquors were examined. These were exhibits in illicit distillery cases or in other cases of fraud.

(3) *Opium and Chandu*.—Reports were made on exhibits in 15 prosecutions under the Chandu Revenue Ordinance.

(4) *Deleterious Drugs*.—Two cases of the importation of deleterious drugs were investigated. In 1 of these 23 bottles labelled “Cocain” were found to contain salicylic acid. Two seizures of bhang were identified.

(5) *Counterfeit Coins*.—Nine lots of exhibits in coining cases were received. The total number of coins examined was 10,148 as well as moulds and other apparatus for the manufacture of coins. Thirty-three samples of chemicals used in connection with currency note forgery were sent in for examination.

In a case of cheating 3 gold medallions were found to have centres of lead.

6. *Explosives*.—Twenty-five samples of explosives were examined in actual or suspected cases of possession of bombs, etc.

(D) OTHER DEPARTMENTS

Samples of water, concrete and fungicide were examined for the Public Works and Fisheries Departments.

(E) COMMERCIAL FIRMS

1. *Petroleum*.—

Importation.—Two hundred and ninety-seven Flash-Point tests were made on 243 consignments of kerosene imported into the Settlement and 39 tests on consignments for transhipment.

The total quantity of kerosene imported was:—

East Indian Oil	..	...	496,716 tins of 4 gallons.
American Oil	...	...	204,614 tins of 4 gallons.

2. *Other Petroleum*.—Complete analyses were made of 18 samples of liquid fuel for the Admiralty and 2 other samples of petroleum were examined for private firms.

3. *Ship Inspection*.—Seventy-nine vessels which had carried petroleum were tested (and certificates issued) before entering the harbour or docks, as a safeguard against explosion or poisoning from petroleum vapour during repairs.

4. *Explosives*.—In 6 shipments of explosives the vessel and cargo were examined prior to discharge, and 15 tests were made as to fitness for import in 21 consignments.

5. *Opium*.—Forty-eight samples from opium shipments were assayed.

6. *Miscellaneous*.—A large number of various specimens were submitted by commercial firms. These consisted chiefly of ores, waters and general produce, including coals, milks, coal gas, gambier, illipe nuts, rubber, patchouli leaves, acetic acid, oil cake, etc.,

(F) GOVERNMENTS OF THE UNFEDERATED MALAY STATES

For the Johore Government reports for Court evidence were made on exhibits in 75 Chandu Revenue, and 11 Liquors Revenue prosecutions.

Two similar reports were made on counterfeit coins (the number of coins being 2,768), two on Deleterious Drugs (Morphine), two on waters and 12 on poisons or viscera. The poisons discovered in the latter were atropine (6 cases) and opium (2 cases).

For the Trengganu Government 50 lots of chandu dross were valued and for the Kelantan Government 9 lots and for the Sarawak Government 1 lot.

(G) GENERAL

Reports were made on 11 applications for Patent Rights.

The Government Analyst served on a Committee appointed by the Government of the Federated Malay States to enquire into the possibility of fixing a standard of purity for toddy, which would prevent adulteration and which could be enforced by law.

The Committee's recommendations have been submitted to the Federated Malay States Government.

A new scale of fees for chemical analyses and investigations designed for general official use throughout the Peninsula has been approved by the Colony and the Unfederated States. This scale is more in accord with the actual value of the services rendered.

The Department has on several occasions acted in an advisory capacity to the Shipping Authorities in connection with the carriage and storage of dangerous cargo.

Staff.—Mr. F. H. GEAKE, M.SC., A.I.C., joined during the year.

The staff now consists of the Government Analyst, four Assistant Analysts and four laboratory Assistants.

The following table shows details of Revenue and Expenditure for the years 1926 and 1927:—

REVENUE				EXPENDITURE			
—				—			
<i>Fees of Office</i>	1926	1927				1927	
—	—	—				—	
	\$	c.	\$	c.		\$	c.
Petroleum Inspection ...	4,475	00	4,060	00	Personal Emoluments ...	34,193	00
Miscellaneous	10,066	00	11,025	00	Stores from England ...	904	00
					Miscellaneous ...	617	62
					Transport ...	534	05
Total ...	15,541	00	15,085	00	Total ...	36,248	67
	\$	c.	\$	c.			
Sale of Pyridine	3,475	50	235	90			

The following summary shows the distribution of the laboratory work during the year 1927:—

SUMMARY OF LABORATORY WORK DONE DURING THE YEAR 1927

Ordinance	Sub-heading	Police	Monopolies	Medical	Other Departments	Other Governments	Commercial	Totals
Explosives	Explosives Tests ...	...	...	...	...	...	15	15
	„ (Other Bomb, &c. ...	25	...	...	...	...	...	25
Petroleum	Kerosene Flash Tests ...	...	...	...	...	...	336	336
	Ship-Inspection ...	...	...	...	...	...	75	75
Poisons	Poisons legal ...	2	...	1	...	...	...	3
Deleterious Drugs	Bhang ...	2	1	...	...	...	1	4
	Drugs Deleterious ...	3	5	1	...	2	1	12
Food and Drug	Milk (Tinned) ...	...	...	4	...	...	6	10
	Milk (Fresh) ...	...	...	8	...	...	...	8
Liquors	Arrack (methylation) ...	...	...	...	...	...	1,180	1,180
	Samsoo ...	...	1,688	...	...	...	...	1,688
	Brandy ...	...	71	...	...	...	...	71
	Other Liquor ...	...	15	...	...	...	2	17
	Illicit ...	35	24	...	...	11	...	70
	Toddy ...	...	192	...	...	1	1	194
Chandu	Chandu (Factory Tests)...	...	52	...	...	...	...	52
	Chandu (Prosec. Cases) ...	15	73	...	...	75	...	163
	Opium Seizures ...	...	64	...	...	...	...	64
	Chandu Dross Assays ...	...	2,900	...	...	1	...	2,901
	„ „ Valuations ...	...	25,908	...	...	...	...	25,908
	Opium Assays ...	...	6	...	...	...	48	54
Other Ordinance	Counterfeit Coins Cases	9	...	...	...	3	...	12
	Poisons Toxicological ...	9	...	6	...	4	...	19
	Prisoners ...	1	...	...	...	...	...	1
	Stomach Washins ...	...	...	30	...	2	...	32
	Viscera ...	...	...	18	...	4	...	22
	Patents ...	...	...	...	11	...	...	11
General	Chemicals ...	...	1	...	...	...	...	1
	Drugs ...	4	...	10	...	...	1	15
	Mineral (Inorganic) ...	...	...	...	...	...	8	8
	Minerals Organic (Coal) ...	...	...	...	...	...	5	5
	„ „ (Petroleum) ...	...	...	...	...	...	20	20
	Stomach of Animals ...	...	...	...	...	2	...	2
	Test-Meals ...	...	...	6	...	...	...	6
	Urine and Blood ...	...	...	31	...	...	6	37
	Water Drinking ...	...	...	55	5	2	14	76
	Water Industrial ...	...	1	4	6	...	13	24
	Miscellaneous ...	42	3	4	2	...	19	70
	Totals for Departments	147	31,004	178	24	108	1,750	33,211

II.—PENANG.

REPORT BY MR. J. W. HADDON, B.SC., F.I.C., *Deputy Analyst, Penang.*

<i>Revenue</i>	<i>1926</i>	<i>1927</i>	<i>Expenditure</i>	<i>1927</i>
—	—	—	—	—
	\$ c.	\$ c.		\$ c.
Petroleum In- spection Fees	2,970 00	3,620 00	Personal Emoluments ...	11,880 00
Miscellaneous	2,553 00	3,466 50	Stores ...	394 06
Certificate f o r Export o f Petroleum ...	158 50	160 00	Miscellaneous ...	286 73
			Transport and Travelling Allowance ...	239 74
Total ...	5,681 50	7,246 50	Total ...	12,800 53

PETROLEUM

Kerosene.—One hundred and twenty-two Flash point tests were carried out on twenty-four consignments of Kerosene imported into the Settlement, and five tests on consignments for transhipment. All the samples tested had a Flashing point higher than 73 degrees Fahrenheit.

The total quantity of Kerosene imported was:—

East Indian Oil—21,885·26 tons and 20,449 four-gallon tins.

American Oil—126,000 four-gallon tins and 500 fifty-five gallon drums.

Other Petroleum.—Two hundred and four Flash point tests were done on 50,434·8 tons of Liquid Fuel and 3,167·16 tons of Solar Oil which were imported during the year.

All the samples tested had a Flashing point higher than 150 degrees Fahrenheit.

Flash point determinations were also carried out on six samples of Diesel Fuel Oil.

EXPLOSIVES

Four consignments of Gelignite, amounting altogether to 156,750 lbs., were imported during the year. Samples from each consignment passed the tests prescribed by the Arms and Explosives Ordinance.

MONOPOLIES DEPARTMENT

The work undertaken for this Department included:—

A. Ordinance No. 117 (Chandu Revenue).

Reports were issued on 213 exhibits connected with prosecutions instituted for various breaches of this ordinance

The Chandu Dross returned by the nine Government smoking shops was examined and reported on monthly.

Five thousand six hundred and sixty-seven lots of Chandu Dross sold to Government by various private smokers were weighed and valued.

Thirty-five lots of Chandu Dross submitted by the Kedah Monopolies Department and twenty-five lots from Perlis were assayed and valued.

B. Ordinance No. 118 (Liquors Revenue)

(1) The alcoholic strength of 2,496 samples of liquor was determined for duty assessment purposes: of these 265 samples were submitted by the Kedah Customs Department.

(2) Twenty-six samples of Brandy, one of Gin, and four of Wine were analysed for purposes of classification.

(3) One hundred and sixty-four exhibits connected with prosecutions under this ordinance were examined and reported on.

(4) Three lots of Bhang were received for identification.

(5) Twenty-seven samples of Toddy were examined; six of these samples did not conform to the special Toddy Regulations under this ordinance.

(6) Ten consignments of Javanese Arrack, amounting in all to 8,800 gallons, were "Methylated" for industrial purposes.

C. Deleterious Drugs Ordinance.

Two seizures of Cocaine Hydrochloride were examined and reported on.

A proprietary "Local Anæsthetic" was found to contain Novocaine.

COUNTERFEIT COINS, ETC.

Three lots of exhibits, comprising 195 counterfeit coins but none of the usual counterfeiter's outfit, were sent in by the Police. Thirty-five exhibits in a case of forging currency notes were examined and reported on.

One hundred and one counterfeit ten-cent pieces were submitted by the Assistant Treasurer.

WATER AND SEWAGE

Chemical analyses were carried out on thirty-six samples of drinking water and twenty samples of Septic Tank Effluent.

Three samples of water were examined as to their suitability for various industrial purposes.

MILK

Nineteen samples of fresh milk were analysed. Two of these samples consisted of "Skimmed Milk" and ten had been adulterated by the addition of water.

Five samples of tinned condensed milk were analysed and reported on.

TOXICOLOGY

Fifteen specimens of Viscera, Stomach contents, Vomit, etc., were received for examination. Oil of Wintergreen was found in three, Opium in two, Alcohol in two and Atropine in one of these specimens.

Nothing deleterious was detected in two sets of food exhibits which were submitted by the Police, nor in a sample of "Chunam" received from the Chief Medical Officer, Kelantan.

MISCELLANEOUS

One hundred and sixty-six articles were examined for chemical evidence of sea water damage.

Seventy-eight samples of various substances not enumerated above were examined and reported on. They included:—Patchouli Leaves (33 samples), Urine (13 samples), Jelutong (7 samples), Patent Indian Medicine (2 samples), Cement Bricks (2 samples), Police exhibits for blood stains (3), Tin ore, Tea, Acetic Acid, Carbon Tetrachloride, Lime Mortar, Quinine Sulphate, Carbolic Acid Soap etc.

One hundred and fifty-three consignments of Rubber were surveyed prior to shipment and certificates issued.

STAFF

I was in charge until the 16th April, when I proceeded to Singapore to act as Government Analyst, Straits Settlements. For the remainder of the year Mr. A. C. BROOKS, Assistant Analyst, Singapore, acted as Deputy Government Analyst, Penang.

APPENDIX "E"

Extracts from the Second Annual Report of the Straits Settlements Rural Sanitation Campaign, 1927, submitted by PAUL F. RUSSELL, M.D., Regular Member, Field Staff of the International Health Division of the Rockefeller Foundation.

I. INTRODUCTION

As explained in the 1926 report of the Straits Settlements Rural Sanitation Campaign, the broad program of this co-operative Health venture by the Straits Settlements Government and the International Health Division of the Rockefeller Foundation, contemplated active work in the Northern Settlement during 1927, having concentrated in Malacca during 1926 and leaving Singapore for 1928. Therefore the office and laboratory of the campaign were moved from Malacca to Penang early in 1927 and will probably remain there during 1928. Not more than four to six months will be devoted to Singapore, the Northern Settlement requiring 18 to 20 months of intensive campaign work.

The following staff has been employed in Penang during the year:—

Director	...	...	Doctor PAUL F. RUSSELL	
Assistant Surgeon	...	...	Doctor GOH KOK KEE	... Chinese.
Sanitary Inspector	...	...	THOMAS JOSHUA	... Tamil.
Dressers (<i>i.e.</i> , male nurses)	...	...	TAN JOO CHOON	... Chinese.
			TAN CHENG HAI	... „
			MOHAMED NOOR	... Indian (Moslem).
			ARUMUGAM	... Indian (Tamil).
			SHAIKH DIN	... Malay.
Chief Clerk	...	...	I. J. KENLAY	... Eurasian.
First Clerk	...	...	D. PETER	... Tamil.
Second Clerk	...	...	THARMALINGAM	... „
Peon	...	...	YUSOP b. MOHAMED	... Malay.
Caretaker	...	...	P. SUPPIAH	... Tamil.
2 Coolies	...	...	AH ANN	... Chinese.
			NAGAN (Butterworth)	... Tamil.

The clerks, peon, caretaker and coolies have been paid from Item 5 of the field office fund budget allowance. The rest of the subordinate staff are employees of the government medical department, assigned to the Straits Settlements Rural Sanitation Campaign temporarily. The staffs of the District Health Centres are not considered as campaign workers but as regular members of the medical personnel whose activities will be in no way affected by the close of the campaign.

The total mileage of the campaign staff during the year in the Northern Settlement has been approximately 60,000 miles, as follows:—

Director and Assistant Surgeon ...	...	20,300 miles.
Subordinate Staff in Penang ...	...	10,055 „
„ „ Province Wellesley ...	...	30,000 „
Total ...		60,355

During the first half of the year the work was confined to Penang Island. After mid-August work was carried on simultaneously in both Penang and Province Wellesley. One dresser each was assigned to Butterworth, Bukit Mertajam and Nibong Tebal in Province Wellesley. These men took up permanent residence in the government hospitals in these three District Centres and each has carried on all of the campaign activities in his own district, reporting at a conference every two weeks at headquarters in Penang. Two dressers remained at headquarters for work in Penang. The Assistant Surgeon supervised the work in both Province Wellesley and Penang. Thus each dresser has learned how to give lectures, to do house-to-house propaganda work, and to make latrine surveys, as well as to examine stool specimens, and give anti-helminth treatments. In this way none has become an expert microscopist but each has become a well-trained field health worker capable of carrying out the proposed program of the District Health Centres. Therefore at the end of the Campaign there will be a staff of health dressers available for the District Units.

No work has been done in the George Town Municipality except in connection with the Government schools or by special invitation in certain clubs. Municipal health departments are emphatically separate institutions, not responsible to the Principal Civil Medical Officer. Therefore the Straits Settlements Rural Sanitation Campaign agreement was made exclusive of the three municipal areas in the Colony,—Singapore Town, George Town (Penang) and Malacca Town. Reference to Tables 4, 10 and 13 will show that intestinal helminth infections are by no means absent in the Municipal areas. It was found necessary to treat 60 per cent of the Municipal school children for either hookworm or roundworm infection (or both). This fact may be taken as good evidence of the locally obvious fact that the Municipal conservancy system in George Town is defective.

II. PUBLICITY

As explained in previous reports the Straits Settlements is a cosmopolitan colony with five main “races” forming the bulk of the population—*viz.*, Malay, Chinese, Indian, Eurasian and European. Many dialects are spoken by the Indians and Chinese, only one dialect by an individual as a rule. Among these languages or dialects are Cantonese, Khek, Hokkien, Tiew Chiew, Hakka, Hok Chia, Hylam, Mandarin, Tamil Singhalese, Malayalam, Telugu, Hindustani, Sikh, Pathan, Malay, Javanese, Siamese, English, Dutch, Portuguese, French and American.

To the difficulties that this Babel of tongues presents to the Health Propogandist must be added the considerable handicap of an abysmal ignorance on the part of the masses of people as regards even the simplest principles of Preventive Medicine. In England and the United States health knowledge may be said to diffuse throughout a group of people but in Malaya it only filters downward, extent being measured in terms of education. Moreover the lower classes are continually moving about. Only Malays and the higher class Chinese have any permanency of residence. Therefore unusual efforts have been made to spread information among the permanent educated classes the propaganda among the uneducated consisting of the mass treatment itself.

1. *Lectures*.—Lectures about hookworm infection have been given in a dozen languages or dialects, including in one case Latin, the common tongue at a Catholic training college for native teachers. The language of the Malays is the lingua franca of Malaya. But, as commonly spoken by foreigners, it is a hybrid dialect useful in commercial matters but useless as a medium for explaining even the relatively simple story of the hookworm. It is a common experience to hear two Chinese transacting business with short sentences composed of Chinese, Malay and English words. Obviously therefore words in Malaya have less value for propaganda purposes than pictures. For this reason, as a rule lectures have been given to small groups of people and have been well illustrated with charts and specimens. The campaign staff was specially chosen so that lecturers in all of the common dialects would be available. See Table 1 for statistics.

Special Public Health Contests are described in Appendix F. These competitions aroused considerable interest in the schools and amongst the general public.

2. *Pamphlets*.—As explained in the 1926 report, a number of hookworm pamphlets have been prepared in the most common languages. These illustrated booklets are well worth while even among a population having a high degree of illiteracy. They have proved especially useful in the schools.

An English pamphlet about roundworm infection has also been distributed in the schools. This has not been put into Malay because it was feared that it might confuse matters at present.

3. *Posters*.—Posters, if carefully prepared, have superlative value in Malaya over all other methods of Health Propaganda. (See the 1926 report for sources of posters used in the Straits Settlements Rural Sanitation Campaign).

In this connection see Appendix F. of this report for a description of a Poster Contest held by the Straits Settlements Rural Sanitation Campaign in the Penang Schools.

The standard hookworm charts of the International Health Division have been very useful. Following the example of Doctor Hydrick in Java, special reproductions of these have been made in a smaller size (8 × 10 in.) See samples in Appendix D. These small posters have the advantage of being more convenient. Moreover they can be passed around from person to person, thus bringing the story closer to the individual than a wall-chart can bring it.

It is amazing how difficult it is to produce a really useful poster and how many poor or even misleading health posters are in use. Several posters have been painted to order during the year by Chinese and Malay artists to illustrate various phases of Preventive Medicine. Three are being reproduced for general distribution.

4. *Moving Pictures*.—The Board's film "Unhooking the Hookworm" has been used successfully in the present campaign many times. An attempt is being made to adapt it to local conditions by cutting out certain parts and inserting Malayan scenes. Not many halls in the Colony, outside the three municipal areas, are equipped for projecting moving pictures. Therefore a portable machine with engine and battery was purchased. The "Translux Daylight" screens have been found of value but they deteriorate rapidly in Malaya even when "specially prepared for tropical use." They are not really daylight screens, in tropical light at least, and require a definite degree of darkness. But if a stage can be darkened completely behind the screen, the hall in front need not be completely dark.

A Krupp-Ernemann Kinox projector has been used as it was the only standard size machine available locally in January, 1927. It has given fair service but seems to cut the films needlessly—a fault reported also from Java. See Table 1 for statistics.

5. *Special Exhibits.*—A special health exhibit at the Penang—Balik Pulau Agrihorticultural show was held from 16th to 18th April, and was noted in the second quarter's Report. The Euscope was particularly useful at that time and subsequently in the office has been of special value for demonstrating microscopic slide to laymen. See Table 1 for statistics.

Special health exhibits are maintained at each of the District Health Centres. These include posters, charts specimens and models. Each Malay vernacular school is being supplied with a set of small hookworm posters and a bottle of hookworms.

6. *Shoes.*—Very few rural Malay schoolchildren wear shoes but every effort is being made to persuade them to do so for, although complete control of soil-pollution is the ultimate goal of the Campaign, many years must elapse before it is safe to travel barefooted in Malayan kampongs.

Two conditions are necessary before the habit of shoewearing will be common among rural schoolchildren:—first, an inertia must be overcome and second, inexpensive shoes must be made available. Once schoolchildren start to wear shoes the habit soon becomes fixed—if cost and accessibility are favourable. In the municipal schools most children over 5 years of age including Malays wear shoes.

With these considerations in mind the director conferred in October with the Hon. Mr. GOODMAN, Secretary for Chinese affairs in the Straits Settlements, and Mr. TAN KAH KEE, Malay's leading manufacturer of shoes. At this meeting Mr. TAN KAH KEE agreed to plan for the manufacture of a special rubber-soled shoe of wide-toe last to retail at a price of about 70 cents Straits (40 cents Gold) per pair. He further generously offered to give 2,000 pairs of these shoes to the Straits Settlements Rural Sanitation Campaign for free distribution to schoolchildren in order to focus attention upon shoe-wearing and to aid in establishing the habit. This offer was widely heralded in the Press and is now being carried out. A thousand foot tracings were taken from Malay schoolchildren by the campaign staff, and special lasts are being made. The Education Department has offered to supervise the distribution and to endeavour in every way to establish this most necessary health habit in Malaya. "Better shoes than shrouds."

7. *Malaria.*—In a country like Malaya where malaria is still very troublesome there is some danger in a hookworm campaign of emphasizing the latter at the expense of the former. An attempt has been made to make it clear that, in Malaya, malaria is more deadly than hookworm infection, that the latter predisposes to the former, that the two diseases work together as blood-destroyers. Moreover the newly established Health Centres are being trained to consider malaria as more important than hookworm infection, but more prevalent because of hookworm infection. The eradication of hookworm infection in Malaya is an important step in the larger task of eradicating malaria.

III. EXAMINATIONS

1. *Stool Diagnosis.*—In the 1926 report, pages 10—24, there was a discussion of the methods of stool diagnosis employed by the Straits Settlements Rural Sanitation Campaign. Little need be added in this report. The staff has remained too small to make it possible to train some of them as expert microscopists. All have been trained in every phase of the campaign work. None has become proficient in making Stoll counts. The meticulous and *sustained* precision of movement and unremitting attention to minute details required by the Stoll counts are habits as foreign to the local technicians in 1927 as in 1926. It would be quite possible to insist on Stoll counts and to report thereafter several thousand a year but they would be approximate counts probably of less practical value than the flotation counts. The official method of diagnosis in the laboratories of the Straits Settlements is the flotation method. The Stoll counts remain, in the opinion of the writer, the best method of counting hookworm eggs—when done by a trained worker. But

the method is not suited to local routine use. One of the aims of the campaign is to train men for local routine service, hence mass Stoll counts are illogical for the Straits Settlements Rural Sanitation Campaign. In Table 16 nearly a thousand Stoll counts are reported, this being about 1/14th the number of flotation counts done. These counts were made by the staff and must be considered approximate.

The flotation counts, as controlled by weighing the specimen, using only fully saturated salt solutions, and enumerating the ova in 20 fields, continue to give adequate information as to intensity of infection in large numbers of cases. Single counts from single specimens are as worthless in flotation as in Stoll counts for estimating the number of worms in an individual.

See Tables 2—16 for statistics.—It will be noted that the general infection rates (whipworms excepted) for the Northern Settlement are less than those for Malacca, thus

GENERAL HELMINTH INFECTION
RATE
STRAITS SETTLEMENTS

(See Tables 2-16 in
Appendix A.)

	Hook- worm	Round- worm	Whip- worm
Malacca, 1926— See 1926 Annual Report ...	79.2 %	66.2 %	66.7 %
Northern Settlement, 1927 ...	61.9 %	63.4 %	73.7 %
Northern Settlement Rural Exclu- sively	87.7 %	82.3 %	90.6 %

The reason for this difference is the inclusion in the Northern Settlement figures of a large number of municipal schoolchildren who, although remarkably heavily infected for a municipal group, are not so heavily burdened as the rural inhabitants. When these municipal schoolchildren are omitted and the figures presented for the *rural* Northern Settlement it is seen that the latter is more heavily infected than Malacca. This would be expected as sanitation in the Northern Settlement is even more backward than it was in Malacca prior to 1926. Conditions as regards nature and habits of population, and the physical characters of the climate and soil are much the same in both areas, although Province Wellesley has more low-lying and sandy areas than Malacca.

In addition to ova of hookworm, roundworm and whipworm, ova of the following intestinal parasites were seen:—

Tænia solium	...	...	3 cases
Tænia saginata	...	...	6 cases
Hymenolepis nana	...	...	3 cases
Hymenolepis diminuta	...	...	3 cases
Dipylidium caninum	...	...	2 cases
Oxyuris yermicularis	...	...	125 cases

Embryos of *strongloides stercoralis* were not seen but this parasite is not uncommon in the Northern Settlement. The flotation method of diagnosis does not often reveal the embryos.

2. *Hemoglobin Determinations*.—The hemoglobin readings, reported in Table 17, were made by the dressers (male nurses) using Tallqvist scales. In all areas malaria is a complicating factor. The usefulness of these hemoglobin readings as a measure of the intensity of hookworm infection in Malaya is dubious, first because malaria or dysentery frequently complicate the picture and second because the Tallqvist scale under the eyes of the local dressers is by no means a stable one.

3. *Spleen Palpations*.—The spleen records in Table 18 were made as explained in the Survey Report of 1925, by Darling's method.

4. *Hospital Laboratory Stool Diagnosis*.—In Table 19 are gathered together stool diagnosis statistics collected from Government Hospitals and Dispensaries in the Colony. The total average incidence rate of 32.8 per cent in 1927 may be compared with the corresponding rate of 41.1 per cent in 1926.

IV. TREATMENTS

A. CAMPAIGN MASS THERAPY

During 1927 the method of giving anti-helminth treatments has been substantially the same as in 1926, explained on page 31–34 of the annual report for that year. The totals for 1927 are shown in Tables 20–22 of this report. There have been no bad results. In a few cases hot soap-suds enemas have been given because of vomiting or severe gastric pain. Twice rumors came that there had been a death following a campaign treatment. Each case was carefully investigated and each proved to be a death from malaria, one two weeks and the other 19 days following treatment.

B. CARBON TETRACHLORIDE TOXEMIA

The following account of carbon tetrachloride poisoning was brought to the director's attention by the private physician concerned:—

“Owing to numerous complaints from Estate managers regarding the effects of carbon tetrachloride treatment on coolies, I have made the following observations which I would like to put before you.

On a healthy estate in South Kedah I treated 200 coolies in the following way:—

Drachms 1, Carbon tetrachloride with Ounces 2, magnesium sulphate, in ounces 2, water.

The coolies were instructed to have nothing to eat before treatment, and the treatment was given before their forenoon meal. I gave the treatment personally and all the coolies were locked up in a large shed for two hours after the treatment. Precautions were taken against the coolies getting “toddy” during the day that treatment was given. The result was as follows:—

200 treated.

27 unfit for work for over two days.

Symptoms.—Excessive vomiting. Severe abdominal pain; 25 of the affected coolies had temperature of over 100° F for a period of two to three days. (Of the coolies with raised temperature only 4 had enlarged spleens).

Sixteen of the affected coolies had albumin in the urine with the signs and symptoms of acute nephritis.

Two coolies died within five days of having the treatment. The diagnosis given at the Government Hospital in both cases was “Heart Failure”.

The carbon tetrachloride used was from a bottle freshly opened and I had the remainder analysed by the Government Pathologist, Penang, whose report was that it was free from carbon bisulphide.

Results such as these are typical of the majority of estates which I visit, and because of this I have stopped carbon tetrachloride treatment as I am not prepared to take responsibility for such risks.

Most of the coolies affected are males and most of these are heavy "toddy" drinkers. But 90% of the male coolies on every estate are heavy toddy drinkers and it is impossible to control this factor.

In private practice I have given carbon tetrachloride treatment extensively, and never had any serious complaints regarding its after effects, and because of this I would suggest as an alternative to mass treatment that in the half yearly musters which I do on all my estates, all cases of Anæmia be treated for hookworm in the Estate hospital—where there is an hospital. They can under such circumstances have a day in hospital before treatment on light diet and no toddy and have a preliminary "purge" before treatment, and can also be under observation after treatment.

Or, are there any points regarding the administration of the drug as formerly given by me which you could suggest as being wrong or any additional points in treatment which would obviate the bad results I have noted?

At present mass treatment by carbon tetrachloride as given hitherto is, in my opinion, impossible."

A sample of the drug used was sent to the Home office for analysis. The following report was received: "I beg to report on the analysis, for U. S. P. requirements (10th Revision) and Carbon disulphid (by Perkin's test), of the sealed 1 lb. bottle of Hopkin & Williams, Ltd. (London) Carbon Tetrachloride labeled as purchased at the Georgetown Dispensary, Penang, Straits Settlements, September 12, 1927.

Report of Analysis

Lab. No. 7496

Carbon tetrachloride (*see* above) from Rockefeller Foundation, N. Y.
Recd. 11/7/27.

Specific gravity (25° C.) ...	...	1.588
Boiling Point ...	...	76.0° C.
Non-volatile matter ...	...	0.0002 gr. per 100 cc.
Test for chlorids ...	...	negative
Test for chlorine ...	...	negative
Test for aldehyde ...	...	negative
Carbonizable matter ...	...	trace
Reaction of water extract ...	...	neutral
Carbon disulphid (Perkin's test) ...	...	none

Samples appears to be a very pure carbon tetrachloride, conforming to the latest U. S. P. requirement." (R. O. BROOKS, Chemist and Food and Drug Inspection Expert, formerly chemist, N. J. Board of Health, etc.)

The following comment was made by Professor LAMSON of Vanderbilt University:—

"We were very much interested in your letter of November, 3rd regarding the cases of poisoning in South Kedah. Such poisoning is exactly what we would expect might occur as these coolies apparently are not any too well nourished people. You probably noticed that Dr. ALLAN states that he has never had any serious complaints from the use of carbon tetrachloride in his private practice, where the individuals

treated are probably on a well balanced diet. It would be extremely interesting if it could be arranged to feed a group of these coolies well, for about ten days before treatment, paying special attention to the calcium content of their diet and see whether they would have the same symptoms as the untreated group.

We also feel that a preliminary treatment with parathyroid extract would probably raise their available calcium sufficiently to protect them against any poisoning from carbon tetrachloride. I do not feel that we should more than indicate therapeutic measures here as we are not dealing with the patients themselves, but it would be extremely interesting if the calcium therapy could be applied in a locality where carbon tetrachloride is known to cause trouble. Some of these patients might possibly have taken alcohol shortly before or moderately soon after treatment which might have aggravated their symptoms, but to us these cases of poisoning sound typical of low calcium intoxication. I wonder if you would be interested in sending Dr. ALLAN your Quarterly Bulletin of July, 1927, in which suggestions for calcium therapy are outlined and see if he would be interested to apply this in the field.

We are carrying on some further experiments which may throw some light on the discomfort which comes on shortly after administration of carbon tetrachloride, but we have not yet obtained sufficient data to be ready to speak of it just yet. Finally, I do not believe that the carbon tetrachloride used was responsible for the intoxications because samples of commercial tetrachloride obtained from various sources by us were apparently no more toxic than the Eastman brand."

In this case it is very likely that undernourishment and surreptitious toddy-tipping were the chief causes of the serious illness. Overdosage can probably be completely ruled out in this instance as the drug was given by the physician concerned.

The first quarterly Bulletin with Dr. LAMSON's suggestions as regards calcium therapy was not received until January, 1928.

C. APOLOGIA

After a consideration of Section VIII and Tables 23 to 25 of this report the question will arise as to the value of the campaign mass treatments, for obviously soil pollution has by no means been controlled in the Straits Settlements. This question may be answered first as regards the treatments within the Penang Municipality. Here there is certain amount of sanitary control, wearing shoes or sandals is common after the first five years of life and it is believed that the majority of those treated by the Campaign will not become re-infected with hookworms. But unfortunately so much of the Municipal Night-soil goes directly to vegetable gardens that roundworm re-infection will doubtless be usual and not exceptional. So many of the outlying Municipal houses, as for example in Jelutong, have either insanitary latrines or none whatever that, although most of the older schoolchildren may by virtue of their foot-covering avoid re-infection, yet the oncoming younger school entrants will be as heavily infected as their predecessors.

As regards the rural area re-infection after campaign treatments is still the rule and not the exception. A year or two hence the hookworm and roundworm infection rates will doubtless be not much, if any, less than before the present mass treatments. But there still remain (1) The educational value of mass anti-helminth therapy (2) The eradication of heavy infections and the general reduction of the total number of worms parasitizing the general population. As noted in the 1926 reports of this campaign and as recently demonstrated by Hill (*Journal of Preventive Medicine*, November, 1927), re-infection in unsanitated areas does not get back to its pre-treatment level for

some years. Therefore since the District Health Centres are to continue mass therapy actively it is hoped that the situation may be held in fair control until sanitation becomes a fact. There is no question whatever that the educational value of mass treatments even in the absence of sanitation is very great. The demonstration of the actual removal of worms in large numbers particularly roundworms, (but, after the lectures, hookworms as well) paves the way for the enforcement of latrine building and makes an otherwise difficult proceeding relatively easy.

In a country where sanitary latrines are so rare, where a sanitary conscience is non-existent in the general public, where ignorance, illiteracy and superstition are universal among all but the governing class and the school children, and where autocratic methods are not in vogue, it is, in the opinion of the director, a question as to whether the control of soil pollution could ever be accomplished without at least one preliminary mass-treatment campaign. Worms in a bottle have little appeal to the average individual in Malaya beyond inducing him perhaps to take some medicine in the general hope that it may be of value. But worms in his own bowel movement just released stir the imagination of even the most ignorant person and may arouse enough antipathy to these parasites to materially lessen his resistance to the idea of spending money for a sanitary latrine.

Therefore it is believed that the present treatment campaign has not been wasted effort although sanitation has not proceeded as rapidly as expected.

V. SANITATION

A. CONSERVANCY

Certain fundamental aspects of the sanitation problem were stated on pages 35-40 of the 1926 report and need not be reiterated here. Progress has been slow but it is possible to measure it.

1. *Malacca*.—(a) All government buildings, including the schools, now have sanitary latrines.

(b) In 1925 none of the gazetted villages had a sanitary conservancy system worthy of the name. In 1926 two pre-existing systems were improved and two other villages were provided with a conservancy system and the householders compelled to instal sanitary bucket latrines. In 1927, 3 villages were added to the list. Preliminary work was done in four others.

(c) Since 1925, the Health Officers in Malacca, with the co-operation of the Malacca Agricultural Medical Board, have made special efforts to induce the estates to instal sanitary latrines. The estate managers have in most cases taken considerable interest in this phase of their work and consequently at the present time very few estates in Malacca of more than 25 acres are without proper sanitary latrine accommodation.

2. *Singapore*.—Of the five gazetted villages in Singapore three have been provided with sanitary conservancy systems, one in 1926 and two in 1927. This does not mean that these villages are completely in control as regards soil pollution yet but it indicates proximity toward that goal. Other villages are to be sanitated in 1928. Labuan also will probably be sanitated in 1928.

3. *Northern Settlement*.—Sanitary progress in the control of soil pollution in the Northern Settlement during the three years of the Survey and Campaign has been very slow indeed. Some of the gazetted villages have a certain number of latrines some of which are sanitary. (*See* Tables 23 and 24).

Estates in Province Wellesley and the Dindings have as a rule sanitary latrines but are below the Malacca standard in this report.

It must not be assumed that nothing at all has been done for as a matter of fact a good deal of preliminary work has been accomplished by the Government Health Officers and the District Officers and a very active program is in prospect for 1928.

(a) Government Buildings in Penang and the Province are to be sanitated. A certain number in Penang have been provided with sanitary latrines in 1927 and it is believed that all will be cared for in 1928. In the Province contracts have been let for all but some schools and it is believed that schools will be provided for early in 1928.

(b) Although no gazetted village has yet been sanitated a number are in the throes of cleansing. In Penang a beginning has been made in Tanjong Tokong, one part of the village being supplied with a back ditch and a model latrine in 1927. Householders in this village are being served with notices that they must build latrines. At Balik Pulau plans are well in hand for a sanitary conservancy system and a certain number of latrines are already present.

In Province Wellesley, although no gazetted village has as yet been sanitated, Butterworth is being considered, Bukit Mertajam already has sanitary latrines in one section, is getting a new back-lane and latrines in another section and will then be at least half cared for. Nibong Tebal is partly provided for and plans are in hand for further work. Simpang Ampat and Sungei Bakap are also partly sanitated. In the Dindings, Lumut is already in the process of establishing a sanitary conservancy system.

Orderly progress is essential. Back-lanes and ditches, with proper alignment, are necessary first steps towards the sanitation of a village. This requires a survey and time. Once this much has been done there remains the serving of notices, under existing laws, the supervision of construction and the provision and supervision of a conservancy removal system.

The word sanitation as used so far in this report has been restricted to mean "control of soil pollution." This is, of course, only one phase of general sanitary progress and mention should be made of such projects as provision of markets, wells and other water supplies, of drains and copings, incinerators and rubbish bins, for which some \$50,000. Straits currency (\$28,500. Gold) was provided in the 1927, *Penang budget* and nearly \$150,000. (\$85,500. Gold) in Province Wellesley.

Altogether the Colony is spending a very considerable sum for its medical and health work and it is doubtful if this amount can be materially increased. Approximately one-tenth of the expenditure of the Colony is for medical and health items. (See Table 29). Altering the apportionment of funds for the curative versus the preventive branches of the medical department may become advisable.

In Tables 23—25 are presented statistics about latrines.

B. PRELIMINARY NOTES ON TWO SOIL "DISINFECTANTS".

The following preliminary experiment indicates the probable futility of attempting to sanitize the soil by means of disinfectant powders, as has been suggested to the director from time to time. At the present time it may be stated positively that soil sanitation can be achieved only by the use of sanitary latrines. There are no "short cuts" or easy alternatives available.

In this experiment the feces used contained an average of eighteen hookworm ova per twenty fields when examined by salt flotation method and an average of 1,200 eggs per gram by the Stoll displacement dilution count. This represents an average infection in a Tamil coolie who has had occasional anti-helminth treatments on an estate where sanitation is not good and reinfection therefore common.

Six petri glass culture dishes were prepared with animal charcoal wet with 150 c.c. tap water. In each of the dishes five grams of the feces were thoroughly mixed with the charcoal. The dishes were then treated as follows:—

1. No disinfectant. Covered with glass top.
2. Two grams "Extermo" distributed evenly over the surface of the charcoal. Culture dish then covered.
3. Two grams "Extermo" mixed thoroughly with the charcoal. Dish then covered.
4. Two grams "Izal" powder distributed evenly over the surface of the charcoal. Culture dish then covered.
5. Two grams "Izal" powder thoroughly mixed with the charcoal. Dish then covered.
6. No. disinfectant. Covered as No. 1.

These cultures were untouched until the sixth day when they were put through the usual modified Bærmann apparatus and examined for larvæ.

Hookworm larvæ were abundant in all cultures. Neither the "Extermo" nor the "Izal" powder had had the least deleterious effect on the hatching and development of hookworm larvæ. In fact there were more larvæ in the "Extermo" cultures than in the control. The fifth dish gave the lowest yield but even here larvæ were abundant.

Dish	Description				Hookworm Larvæ
1.	Control	...	...	...	106 per 0.15 c.c.
2.	Extermo on top	...	...	...	89 „ „
3.	„ mixed	...	...	...	157 „ „
4.	Izal powder on top	...	...	...	93 „ „
5.	„ „ mixed	...	...	...	65 „ „
6.	Control	...	...	...	90 „ „

(One c.c. of fluid removed from Baermann apparatus, 0.15 c.c. examined.)

Izal powder is said by the manufacturers to be germicidally equivalent to a carbolic powder containing 60 per cent carbolic acid, or four times the strength of ordinary 15 per cent carbolic powder. It is therefore a fairly powerful disinfectant. It should also be noted that two grams of disinfectant were used to five grams of feces and 179 grams of charcoal, so that a fairly large amount of disinfectant was used.

VI.—DISTRICT HEALTH CENTRES.

District Health Centres were described in the 1926 quarterly and annual reports and not much need be added at this time. Each Centre or Unit consists of a part-time health officer, a female health nurse, a male health nurse, one to three sanitary inspectors, a part-time microscopist and a caretaker. One such unit was started in Jasin, Malacca, in October, 1926. During 1927 two have been started in the Northern Settlement, (Tanjong Tokong, Penang in September, and Butterworth in December in the Province) two in Singapore, (Paya Lebar in May, and Joo Chiat Road in June,) and one more in Malacca (Alor Gajah in December.) so that there are now six.

There are now in effect four Health Sisters in the Colony. Two, Misses I. M. M. SIMMONS and A. MCNEILL are in Singapore, the former at Paya Lebar and the latter at Joo Chiat Road. Each has charge of a clinic for Child Welfare Work when they attend twice a week from 9 to 11. The rest of their time is taken up with district visiting throughout the Island, both house-to-house, and also, in connexion with a Travelling Dispensary, started in May, 1927.

In Malacca Mrs. OATES functions in effect as a Health Sister. She has been in Alor Gajah since 1st December. There is a Tamil Health Nurse in Jasin.

In Penang Miss DARVILLE has been Health Sister and has opened the Welfare Clinics at Tanjong Tokong in Penang and Butterworth in the Province. She has a Chinese Health Nurse in Tanjong Tokong and a Tamil Health Nurse or Visitor in Butterworth. Misses DARVILLE and MCNEILL were guests of the Rockefeller Foundation in the United States in 1926.

The response of the general public is indeed notable. Mothers of all races come with their babies for advice and treatment, anti-helminth treatments are given in schools, estates and elsewhere, general treatments for minor complaints are given in fairly large numbers. Statistics are given in Table 26.

By the end of 1928 there will have elapsed time enough to test the usefulness of the Health Centre idea in the Straits Settlements and at that time a full report will be made. At present one can only say that there seems to be no doubt whatever that this form of rural health work is well suited to local conditions.

VII.—EXPENDITURE

The budget of the Straits Settlements Rural Sanitation Campaign for 1927 was S. \$36,000, (G. \$20,520.) of which S. 21,200, (G. \$12,084.) was provided by the International Health Division of the Rockefeller Foundation and the balance by the Straits Settlements Government. Actually the Government voted S. \$20,000, (G. \$11,400.) which was expended for the travel of the campaign staff (exclusive of the director) and in part for salaries of male dressers, or female nurses at Health Centres, rental for the Tanjong Tokong Health Centre, materials and equipment for Health Centres in Malacca and the Northern Settlement and in many other ways. A complete financial report will be available in due time. It should also be noted that most of the money for routine sanitation comes by Government vote and is not included in the campaign allowance. The money voted by the International Health Division was spent for office expenses, propaganda, drugs and equipment.

VIII.—ACKNOWLEDGMENTS.

The director wishes to acknowledge the co-operation of the medical and health staff of the Straits Settlements, officials of the Malayan Civil Service, the local press and many individuals whose help has made the success of the treatment and propaganda work possible.

Special mention, outside the medical staff, should be made of Mr. H. R. CHEESEMAN, Inspector (*i.e.* Superintendent) of Schools, Penang and members of his staff. He has assisted constantly and enthusiastically in the campaign as it related to the schools of the Northern Settlement. In Appendix C there is, for example, a specimen examination paper for Malay Vernacular Schools, in which the first question asked is about hookworm infection. This is by no means the only instance when the Department of Education in Penang has actively co-operated with the Campaign.

Furthermore the director would testify to the good work of his staff, who have shown a real interest in their work. Assistant Surgeon Doctor GOH KOK KEE has taken a considerable amount of responsibility successfully and is to be specially commended.

IX.—SUMMARY.

The second year (1927) of the Straits Settlements Rural Sanitation Campaign,—a co-operative attempt on the part of the local Medical Department and the International Health Division of the Rockefeller Foundation to—

1. *Establish sanitary night-soil conservancy universally throughout the Colony.*—1,933 latrines repaired or built, 14 gazetted villages partly sanitated.

2. *Give free stool examinations and anti-helminth treatments to all who will have them, using mass therapy methods.*—13,603 persons examined, of whom only 11 per cent were free of intestinal parasites, 62 per cent being infected with hookworms and 63 per cent with roundworms. Thirty-two thousand five hundred and fifteen persons given first treatment.

3. *Inaugurate and develop District Health Centres which will carry on all phases of rural health service.*—Two Centres in Singapore, 1 in Malacca and 2 in Northern Settlement started in 1927, a total of 5 for the year and 6 for the Colony (1 having been opened in 1926).

4. *Spread Health propaganda.*

(a) Lectures or house-to-house visits to 49,000 people. At least one lecture in every English and Malay Vernacular School in Penang and Province Wellesley, including the Georgetown municipality.

(b) Preparation of illustrated hookworm booklets in English, Malay-script and romanized, Chinese, and Indian: roundworm booklet in English.

(c) Preparation of posters illustrating various phases of hookworm and roundworm infections.

(d) Pamphlets distributed—63,000 copies.

(e) Health Poster Contest, and Health Elocution Contest organized in Penang Schools.

(f) Use of cinema, baloptician or euscope 300 times.

(g) Special exhibit at Balik Pulau Horti-agricultural show for 3 days.

(h) Attention focused on shoes as an aid to prevention. Local manufacturer induced to make an inexpensive shoe of special last and to donate 2,000 pairs to encourage a shoe-wearing habit.

(i) Total mileage by campaign staff in carrying out these activities 60,355 miles February-December, 1927 inclusive. (Campaign staff—1 Assistant Surgeon, 1 Sanitary Inspector and 5 male nurses in addition to the director.)

APPENDIX A.—TABLES.

1. Public Health Lectures.
2. Hookworm Infection Incidence by Race and Residence in Northern Settlement.
3. Hookworm Infection Incidence by Race and Sex of Hosts—general.
4. Hookworm Infection Incidence by Race of Hosts—Municipal Schools.
5. Hookworm Infection Incidence by Race of Hosts—Rural exclusively.
6. ,, ,, ,, ,, Age of Hosts—general.
7. ,, ,, ,, ,, Occupation of Hosts—general.
8. ,, ,, ,, ,, Place of Birth and Residence of Hosts—general.
9. ,, ,, Intensity ,, Race—general.
10. ,, ,, ,, ,, Municipal Schools.
11. ,, ,, ,, ,, Comparative standards.
12. Roundworm and Whipworm Infection Incidence by Race of Host—general.
13. Roundworm and Whipworm Infection Incidence by Municipal Schools.
14. Multiplicity of Species of Helminths Harbored by Individual Hosts—general.
15. Multiplicity of Species of Helminths Harbored by Municipal Schools.
16. Stoll Dilution Counts of Hookworm Ova.
17. Hemoglobin Examinations.
18. Spleen Palpations.
19. Stool Examinations in Government Hospitals and Dispensaries.
20. Campaign Anthelmintic Treatments.
21. Government Hospital and Dispensary anthelmintic treatments and Hookworm incidence.
22. Total anthelmintic treatments in Straits Settlements.
23. Latrine Surveys in Province Wellesley.
24. Latrine Survey Summary.
25. Latrines Built (as reported by Government Health Officers).
26. District Health Centre Statistics.
27. Tanjong Tokong Health Survey census Births, Deaths.
28. ,, ,, ,, ,, Incidence of Disease.
29. Expenditure for Medical and Sanitary Services Straits Settlements 1926.
30. Vital Statistics Straits Settlements 1926.

TABLE NUMBER 1 PUBLIC HEALTH LECTURES IN THE NORTHERN SETTLEMENT BY CAMPAIGN STAFF, 1927

GROUPING		Malay	Indian	Chinese	Others	Totals
Number of Lectures grouped according to the Language of Lecturer ...		414	94	256	128	892
Number in Attendance grouped according to Race ...		24,102	3,764	19,125	2,002	48,993
Cinema Shows ...		...	..	...	...	110
Baloptican Shows ...		...	...	...	...	30
Times Euscope used ...		...	...	...	...	187
Pamphlets distributed ...		...	...	...	...	63,600

N.B.—1. Several dialects are included under both Indian and Chinese.

TABLE No. 2.

HOOKWORM INFECTION INCIDENCE BY RACE ACCORDING TO RESIDENCE IN THE THREE RURAL AREAS OF THE NORTHERN SETTLEMENT

	Penang			Province Wellesley			Dindings			Totals		
	Exam.	Pos.	Pos.	Exam.	Pos.	Pos.	Exam.	Pos.	Pos.	Exam.	Pos.	Pos.
Malay	4,613	3,760	81.5	1,768	1,697	%	364	292	%	6,745	5,749	85.2
Indian	828	389	47.0	159	110	69.2	260	126	48.5	1,247	625	50.1
Chinese	4,619	1,593	34.5	250	179	71.6	1	1	100.0	4,870	1,773	36.4
Eurasian	492	178	36.2	12	5	41.7	...	...	...	504	183	36.3
European	98	29	29.6	1	1	100.0	1	...	...	100	30	30.0
Others	135	59	43.7	2	1	50.0	...	..	...	137	60	43.7
Totals ...	10,785	6,008	55.7	2,192	1,993	90.9	626	419	66.9	13,603	8,420	61.9

N.B.—1. Schoolchildren in George Town Municipality included.

TABLE NO. 3 HOOKWORM INFECTION INCIDENCE BY RACE AND SEX OF HOSTS, NORTHERN SETTLEMENT, 1927

RACE	MALES			FEMALES			TOTALS		
	Examined	Positive	Percent Positive	Examined	Positive	Percent Positive	Examined	Positive	Percent Positive
	No.	No.	%	No.	No.	%	No.	No.	%
Malay	...	...	...	...	...	...	...	...	...
Indian	...	...	...	...	...	...	...	...	...
Chinese	...	...	...	...	...	...	...	...	...
Eurasian	...	...	...	...	...	...	...	...	...
European	...	...	...	...	...	...	...	...	...
Others	...	...	...	...	...	...	...	...	...
Totals	...	...	...	...	...	...	...	...	...
	5,667	4,897	86.4	1,078	852	79.0	6,745	5,749	85.2
	936	481	51.4	311	144	46.3	1,247	625	50.1
	3,666	1,431	39.0	1,204	342	28.4	4,870	1,773	36.4
	222	98	44.1	282	85	30.1	504	183	36.3
	65	27	41.5	35	3	8.6	100	30	30.0
	105	49	46.7	32	12	37.5	137	60	43.7
Totals	10,561	6,980	65.5	2,942	1,438	48.8	13,603	8,420	61.9

N.B.—1. This table includes all stool examinations by the campaign staff in 1927 in the Northern Settlement.

TABLE NO.4.

HOOKWORM INFECTION INCIDENCE BY RACE OF HOSTS GOVERNMENT SCHOOLS IN THE GEORGE TOWN MUNICIPALITY—1927.

Race	English Schools			Malay Schools			Totals		
	Exam.	Pos.	Pos.	Exam.	Pos.	Pos.	Exam.	Pos.	Pos.
	No.	No.	%	No.	No.	%	No.	No.	%
Malay	...	...	...	...	...	...	...	...	...
Indian	...	...	...	...	...	...	...	...	...
Chinese	...	...	...	...	...	...	...	...	...
Eurasian	...	...	...	...	...	...	...	...	...
European	...	...	...	...	...	...	...	...	...
Others	...	...	...	...	...	...	...	...	...
Totals	...	...	...	...	...	...	...	...	...
	604	443	73.3	1,286	748	58.2	1,890	1,191	63.0
	556	244	43.9	40	21	52.5	596	265	44.5
	3,943	1,015	25.7	...	...	...	3,943	1,015	26.7
	451	137	30.4	...	...	...	451	137	30.4
	87	27	31.0	...	...	...	87	27	31.0
	68	26	38.2	5	2	40.0	73	28	38.4
Totals	5,709	1,892	33.1	1,331	771	57.9	7,040	2,663	37.8

TABLE NUMBER 5.

HOOKWORM INFECTION INCIDENCE BY RACE OF HOSTS RURAL
EXCLUSIVELY—1927 NORTHERN SETTLEMENT.

Race				Number Examined	Number Positive	Percent Positive
Malay	...	...		4,855	4,558	93·9
Indian	...	...		651	360	55·3
Chinese	...	...		927	758	81·8
Eurasian	...	...		53	46	86·8
European	...	...		13	3	23·1
Others	...	...		64	32	50·0
Totals ...				6,563	5,757	87·7

TABLE NUMBER 6.

HOOKWORM INFECTION INCIDENCE BY AGE OF HOSTS, NORTHERN
SETTLEMENT, 1927.

Age Groups				Number Examined	Number Positive	Percent Positive
0— 5 years	...	...		421	246	58·4
6—18	„	...		12,003	7,577	63·1
19—40	„	...		1,030	509	50·7
41—60	„	...		138	85	61·6
Over 60	„	...		11	5	45·4
Total ...				13,603	8,422	61·9

TABLE NUMBER 7.

HOOKWORM INFECTION INCIDENCE BY OCCUPATION OF HOST,
NORTHERN SETTLEMENT, 1927.

Occupation Groups			Number Examined	Number Positive	Percent Positive
Agriculture	...	...	188	126	67.0
Desk-Shop	...	...	414	184	44.4
Street	...	...	438	228	52.1
Artesan	...	...	4	4	100.0
Marine	...	...	31	31	100.0
Domestic	...	...	12,528	7,848	62.6
Totals			13,603	8,421	61.9

N.B.—1. Schoolchildren are classed as "Domestic".

TABLE NUMBER 8.

HOOKWORM INFECTION INCIDENCE BY PLACE OF BIRTH AND RESIDENCE
NORTHERN SETTLEMENT, 1927.

Groups			Number Examined	Number Positive	Percent Positive
Foreign Born	...	...	1,391	478	34.4
Malaya Born	...	...	12,122	7,697	63.5
Totals			13,513	8,175	60.5
Estate dwellers	...	...	62	28	45.1
Non-Estate dwellers	...	...	13,541	8,392	62.0
Totals			13,603	8,420	61.9

TABLE NUMBER 9 . . . HOOKWORM INFECTION INTENSITY IN NORTHERN SETTLEMENT BY RACE.

RACE	Number Examined	Negative		One Plus		Two Plus		Three Plus		Four Plus	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Malay	6,745	996	14.8	1,824	27.0	2,288	33.9	1,038	15.4	600	9.0
Indian	1,247	622	49.9	384	30.8	145	11.6	61	4.9	35	2.8
Chinese	4,870	3,097	83.6	1,024	21.0	492	10.1	169	3.5	88	1.8
Eurasian	504	321	63.7	101	20.0	51	10.1	21	4.2	10	2.0
European	100	70	70.0	18	18.0	6	6.0	5	5.0	1	1.0
Others	137	77	56.2	37	27.0	14	10.2	8	5.8	2	1.4
Totals	13,603	5,183	38.1	3,388	24.9	2,996	22.0	1,302	9.5	736	5.4

N.B.—1. Examination by salt-flotation method

TABLE NO. 10.

INTENSITY OF HOOKWORM INFECTION GEORGE TOWN MUNICIPAL SCHOOLS 1927, PENANG.

	Number of pupils Examined	Negative		One Plus		Two Plus		Three Plus		Four Plus	
		No.	%	No.	%	No.	%	No.	%	No.	%
Malay Schools	1,331	560	42.1	363	27.3	279	21.0	92	6.9	37	2.7
English Schools	5,709	3,817	66.9	1,138	19.9	446	7.8	189	3.3	119	2.1
Totals	7,040	4,377	62.2	1,501	21.3	725	10.3	281	4.0	156	2.2

TABLE NUMBER 11

INTENSITY GROUPING IN NORTHERN SETTLEMENT BY SALT-FLOTATION METHOD
 COMPARED WITH OTHER STANDARDS, 1927

CHINA HOOKWORM COMMISSION					STRAITS SETTLEMENTS CAMPAIGN GROUPING							
GROUP	Dilution Count E. P. G. Formed Stool (1)	Total Hookworms E. P. G. Divided by 100	Clinical Grouping	Aver. Hemog- lobin	Darling's Blood loss Groups	PLUS-PLUS GROUP 2 GRAM, 20-FIELD COUNTS			Penang Municipal Schools		Northern Settlement Rural only	
						Class	Ova Counts	Estimated Hook- worm	Number	Percent	Number	Percent
I	...	Negative	None	67.1	A Blood loss Compen- sated	Neg.	Neg.	None	4,377	62.2	806	12.3
II	...	1-399 mean 200	1— 3.9	69.3		+	10 or less	20 or less	1,501	21.3	1,885	29.0
III	...	400-2,999 mean 1,700	4—29.9	62.4	B Blood balance dis- turned or breaking	++	11-29	21 to 59	725	10.3	2,271	35.8
IV	...	3,000-9,999 mean 6,500	30 —99.9	54.9		+++	30-59	60 to 119	281	4.0	1,021	16.1
V	...	10,000 and over	100 or more	40.6	C Blood loss not com- pensated	++++	60 or more	120 or more	156	2.2	580	6.8

TABLE No. 14

MULTIPLICITY OF SPECIES OF HELMINTHS HARBORED BY INDIVIDUAL HOSTS, BY RACE IN THE NORTHERN SETTLEMENT, 1927

Grouping	Total Examined	No. ova of Intestinal Worms		At least One species of Worm		At least Two species of Worms		At least Three species of Worms		At least Four species of Worms	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Malay	...	242	3.6	6,503	96.4	5,270	78.1	5,148	76.3	46	.7
Indian	...	165	13.2	1,082	86.8	796	63.8	360	28.8	6	.5
Chinese	...	924	18.9	3,946	81.1	2,355	48.4	1,054	21.6	4	.1
Eurasian	...	94	18.7	410	81.3	259	51.4	99	19.6	1	.2
European	...	34	34.0	66	66.0	27	27.0	7	7.0	...	...
Others	...	31	22.6	106	77.4	59	43.1	18	13.1	...	...
Totals	13,603	1,490	11.0	12,113	89.0	8,766	64.4	6,686	49.0	57	.4

TABLE No. 15

MULTIPLICITY OF SPECIES OF HELMINTHS HARBORED BY INDIVIDUAL HOSTS—MUNICIPAL SCHOOLS, GEORGE TOWN, 1927

Grouping	No. Examined	No. ova of Intestinal worms		At least ONE species of worm		At least TWO species of worms		At least THREE species of worms		At least FOUR species of worms	
		No.	%	No.	%	No.	%	No.	%	No.	%
Malay Schools	...	...	...	...	...	...	...	...	...	...	...
English Schools	...	...	...	...	...	...	...	...	...	...	...
Totals	...	...	...	...	...	...	...	...	...	...	...
	1,331	173	13.0	1,156	87.0	1,104	82.9	1,724	54.4	8	.6
	5,709	1,048	18.4	4,661	81.6	2,733	47.9	1,017	17.8	13	.2
	7,040	1,221	17.3	5,819	82.7	3,837	54.5	1,741	24.7	21	.3

TABLE NO. 16

STOOL DILUTION COUNTS—NORTHERN SETTLEMENT, 1927

Race	No. of cases	Total E. P. G.	Average E. P. G.	Estimated Average No. Female Hookworms	Estimated Total No. of Hookworms
Malay ...	504	1,211,000	2,403	48	96
Indian ...	90	197,000	2,188	44	88
Chinese ...	345	672,400	1,949	39	78
Totals ...	939	2,080,400	2,216	44	88

N.B.—1. See Section V 1a in the 1926 Annual Report for explanation of conversion factors. Also Table 11 of that report. Factor 50 used to change E. P. G. (eggs per gram) to female worms. Factor 2 used to convert this number to estimated total worms. Stools all classed as mushy. All cases rural.

TABLE NO. 17

HAEMOGLOBIN EXAMINATIONS, NORTHERN SETTLEMENT, 1927

Number Examined ...	...	...	...	...	4,340
Average Hemoglobin ...	...	...	...	...	58%
Number 60 per cent or less ...	...	...	...	...	2,846
Per cent 60 or less ...	...	...	...	...	65.6

TABLE NO. 18

SPLEEN PALPATIONS, NORTHERN SETTLEMENT, 1927

	Number	Per cent.
Number Examined ...	521	...
Spleen Negative ...	357	68.5
„ Palpable on Inspiration ...	93	17.9
„ Palpable ...	35	6.7
„ 1-3 finger's breadth ...	32	6.1
„ Umbilious or Pelvic ...	4	.8
Total palpable spleen ...	164	31.5

TABLE NO. 19

STOOL EXAMINATIONS IN GOVERNMENT HOSPITALS AND DISPENSARIES,
STRAITS SETTLEMENTS, 1927.

Grouping	Stools Examined	Stools Showing Hookworm Ova	
		Number	Per cent
Hospitals	66,991	21,899	32·7
Dispensaries	7,320	2,474	33·8
Totals	74,311	24,373	32·8

TABLE NO. 20

CAMPAIGN ANTI-HELMINTH TREATMENTS, 1927

Race	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
Malay	1,508	4,656	4,995	7,925	19,081
Indian	673	354	3,111	3,079	7,217
Chinese	344	3,188	1,117	737	5,386
Others	40	193	369	229	831
Totals	2,565	8,391	9,592	11,970	32,515

N.B.—1. Of the 1st quarter treatments 1,949 were given in Malacca, by the campaign staff in January. All other campaign treatments were given in the Northern Settlement.

TABLE NO. 21

HOOKWORM INFECTION INCIDENCE AND ANTHELMINTIC TREATMENTS IN GOVERNMENT HOSPITALS AND DISPENSARIES, STRAITS SETTLEMENTS, 1927

Groups	CASES DIAGNOSED PRIMARILY AS HOOKWORM DISEASE		Anthelmintic treatments
	Number	Per cent of Total Admis- sion or treatments	
Hospitals ...	4,601	6.9	19,544
Dispensaries ...	3,829	3.2	10,345
Quarantine ...	...	...	41,447
Total ...	8,530	4.6	71,336

TABLE NO. 22

TOTAL NUMBER ANTHELMINTIC TREATMENTS IN STRAITS SETTLEMENTS, 1927

Group	Number
Sanitation Campaign, Malacca	1,949
Sanitation Campaign, Penang	30,566
District Health Centres	3,320
Government Hospitals and Dispensaries	71,336
Estate Coolies and School-children (treated by Government Officers outside of Hospital or Dispensary)	9,008
Malacca Agricultural Medical Board	18,174
Private physicians, Penang and Province only (8 reports) ...	14,210
Total Number of Anthelmintic treatments reported to Campaign office in 1927	148,563

TABLE NO. 23

LATRINE SURVEYS IN PROVINCE WELLESLEY, AUGUST - DECEMBER, 1927

Villages	Houses	Population	Sanitary Latrines	Insanitary Latrines	No Latrine
Sungei Bakap ...	400	1,765	23	133	244
Bukit Tambu ...	292	1,225	15	145	132
Nibong Tebal ...	588	2,223	68	248	272
Tassek Junjong	22	102	—	11	11
Ptg. Tok Mahat	48	188	—	—	48
Pulau Kera ...	85	290	—	—	85
Sungei Duri ...	22	68	—	—	22
Chanykat	124	520	—	—	124
Penaga	86	295	2	29	55
Kota Anu ...	53	186	—	—	53
Ptg. Bindahari	106	280	—	19	87
Lahar Minyak ...	50	102	—	3	47
Prai	184	1,115	12	59	113
Telok Ayer Tawar	141	467	—	36	105
Sungei Puyu ...	77	244	—	23	54
Butterworth ...	821	3,621	28	138	655
Bukit Mertajam	680	3,690	395	45	240
Bukit Tengah ...	188	723	1	28	159
Machang Buboh	100	609	—	42	58
Sungei Rambei	135	473	9	18	108
Tanah Liat ...	210	1,021	20	35	155
Totals ...	4,412	19,207	No. 573	No. 1,012	No. 2,827
			% 13.0	% 22.9	% 64.1

TABLE No. 24

LATRINE SURVEYS—NORTHERN SETTLEMENT, 1927						
	Penang Island		Province Wellesley		Northern Settlement Totals	
	Number	Per cent	Number	Per cent	Number	Per cent
Villages Surveyed	18	—	21	—	39	—
Houses Surveyed	2,608	100.0	4,412	100.0	7,020	100.0
Population Surveyed	10,203	—	19,207	—	29,410	—
Houses with Sanitary Latrines	340	13.0	573	13.0	913	13.0
Houses with Insanitary Latrines	336	12.9	1,012	22.9	1,348	19.2
Houses with no Latrines	1,932	74.1	2,827	64.1	4,759	67.8

TABLE No. 25.

LATRINE PROGRESS 1927—(AS REPORTED BY GOVERNMENT HEALTH OFFICERS).

Location	Old Latrines Repaired	New Latrines Built	Totals
Singapore	330	336	666
Labuan	9	154	163
Malacca	—	497	497
Penang (Rural)	185	22	207
Province Wellesley	173	194	367
Dindings	10	23	33
Totals	707	1,226	1,933

TABLE No. 26

DISTRICT HEALTH CENTRE STATISTICS, 1927

	Malacca		Northern Settlement		Singapore		Totals
	Jasin	Alor Gajah	Tanjong Tokong	Butterworth	Joo Chiat	Paya Lebar	
Lectures	658	3	112	—	—	—	773
Attendances at Lectures ...	6,917	207	1,100	—	—	—	8,224
Anti-helminth treatments given ...	2,679	327	302	12	—	—	3,320
Attendances at Health Centre ...	1,394	—	2,510	102	578	955	5,539
Treatments given by Health Centre (excluding anti-helminth treatments) ...	—	10	2,208	90	928	2,182	5,408
Visits made by Sister or Nurse (Including Revisits) ...	2,632	135	2,372	974	2,231	4,680	13,024
Stools Examined ...	1,401	352	—	—	—	—	1,753
Positive Hookworm ...	1,000	305	—	—	—	—	1,305

Jasin Unit opened in 1926
 Alor Gajah opened 6th December, 1927
 Tanjong Tokong opened 1st August, 1927

Butterworth Unit opened 21st August, 1927 (Nurse began visiting in November).
 Paya Lebar opened in 2nd May, 1927.
 Joo Chiat Road opened 11th June, 1927.

TABLE No. 27

TANJONG TOKONG HEALTH SURVEY 1927, PENANG

—		Malay	Indian	Chinese	Others	Totals
Adults	...	639	66	275	12	992
Children under 14	...	346	37	133	8	524
Total Census	...	985	103	408	20	1,516
Births 1926	...	50	7	58	—	115
“ 1927	...	74	12	56	—	142
Deaths 1926	...	65	6	51	1	123
“ 1927	...	83	16	56	1	156
Malaria Deaths 1926	...	—	—	—	—	29
“ “ 1927	...	—	—	—	—	55
Malaria Deaths Per cent of Total 1926		—	—	—	—	24.4
Malaria Deaths Per cent of Total 1927		—	—	—	—	35.4

N.B.—1. The crude birth and death-rates are not given because the census as given has not yet been checked. It was taken by a dresser from house to house
The total births and deaths and also deaths from malaria were taken from the police records in Tanjong Tokong.

TABLE NO. 28

TANJONG TOKONG HEALTH SURVEY 1927, NUMBER OF LATRINES AND
INCIDENCE OF DISEASE

Number of Houses	...	...	...	...	382
Houses without Latrines	...	...	...	...	348
Per cent	...	...	...	...	91.1
Houses with Insanitary Latrines	...	...	...	...	19
Per cent	...	...	...	...	5.0
Houses with no Latrines	...	...	...	...	15
Per cent	...	...	...	...	3.9
Examined for Helminth	...	...	...	...	166
Per cent Hookworm Infection	...	...	...	...	69.3
Per cent Roundworm Infection	...	...	...	...	77.1
Per cent Whipworm Infection	...	...	...	...	78.9
History of measles	...	...	...	...	250
Small-pox	...	...	...	...	156
Yaws	...	...	...	...	40
Ulcers	...	...	...	...	27
Chicken-pox	...	...	...	...	24
Ophthalmia	...	...	...	...	12
Venereal Disease	...	...	...	...	10
Scabies	...	...	...	...	9
Ringworm	...	...	...	...	8
Tuberculosis	...	...	...	...	3
Malaria in 1927	...	...	...	...	12

N.B.—1. Timidity and reticence have modified these figures no doubt considerably although the survey was made by a local male nurse.

TABLE No. 29

EXPENDITURES FOR MEDICAL AND SANITARY SERVICES STRAITS SETTLEMENTS, 1926

		Straits Currency			
		Medical and Sanitary Expenditure (Net)	Per Capita Expenditure Total	Per Capita Expenditure Health Branch	
		\$ c.	\$ c.	\$ c.	
Singapore Government	...	1,757,360 87	5.05	3.89 Rural	
Singapore Municipality (Health Branch only)	...	822,659 70		1.99 Municipal	
Northern Settlement Government	...	605,018 69	2.41	}	
George Town Municipality (Health Branch only)	...	139,176 10			
Malacca Government	...	261,275 95	1.52		}
Malacca Municipality (Health Branch only)	...	19,470 11			
Labuan Government	...	16,502 69	2.89		
Straits Settlements Totals (Includes Municipalities)	...	3,621,464 11	S 3.53 G 2.01	S 1.56 G 0.89	

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Figures not accessible in time for report.

N.B.—1. Compiled from 1926 Report of the Medical Department and 1927 Whittaker's Almanac.
2. See Table 30 for population statistics.
3. Total Revenue of the Straits Settlements in 1926 \$36,465,203.
" Expenditure " \$36,955,641.
Therefore for Medical and Sanitary services the Colony spent in 1926 9.9 per cent of its income
9.8 per cent of its total expenditure.
4. The total includes S. \$122,448.13 for College of Medicine.
5. Of Government (excluding Municipal) expenditures for medical and sanitary services 23.4 per cent goes to the Preventive Branch.

VITAL STATISTICS STRAITS SETTLEMENTS, 1926

Settlement	Area Sq. Miles	Population	Crude Death rate per 1000	Birth rate per 1000	Infant mortality per 1000	Mean temperature	Rainfall mm
Singapore (Rural) ...	217	80,148	32.90	34.43	222.4	79.9	2,172
Labuan ...	28	5,694	—	—	—	—	—
Penang (Rural) ...	108	41,022	39.39	36.44	161.87	82.2	2,967
Province Wellesley ...	288	131,930	32.21	34.54	136.93	81.9	—
Dindings ...	183	16,260	29.29	29.03	205.07	—	—
Malacca (Total) ...	720	184,437	30.40	36.00	268.22	83.0	2,409
Totals ...	1600	459,491	—	—	—	—	—

N.B.—1. Population of Municipal Singapore 431,240.
Population of Municipal, Penang (Georgetown) 135,104.
Total Population Straits Settlements 1,025,825.
Total sq. miles includes Cocos and Christmas Islands.
2. Of the total deaths from all causes in 1926 in the Straits Settlements 56 per cent were due to Preventable Diseases.
3. Of all persons admitted as patients into Government hospitals in 1926 55 per cent were suffering from Preventable Diseases. Moreover 72 per cent of all hospital deaths in 1926 were due to Preventable Diseases.

APPENDIX "F"

TAN TOCK SENG HOSPITAL, SINGAPORE

REPORT BY J. C. CARSON, M.B., Ch.B., B.A.O., D.T.M.

1. Work done.

Remained on 31st December, 1926	...	...	943
Admitted during 1927	...	...	17,601
			<hr/> 18,544
Discharged	...	...	11,350
Died	...	...	1,990
Absconded	...	...	3,985
Transferred	...	...	178
Remaining on 31st December, 1927	...	...	1,041
			<hr/> 18,544

2. The average daily sick was 967.10 as compared with 923.52 in 1926.

3. The percentage of deaths to total treated was 10.73 per cent as compared with 9.66 per cent in 1926.

4. The total number of deaths was 1,990. Of these 478 died within 24 hours of admission. Deducting these the death-rate was 8.15 per cent.

5. *Malaria*.—There was a decrease in this infection, the numbers falling from 5,848 in 1926 to 5,574 during the ensuing year. Of these 284 died giving a death-rate of 5.09 per cent as compared with 6.27 per cent the previous year. Sixty-six cases died within 24 hours of admission, deducting these the death-rate becomes reduced to 3.91 per cent.

<i>Type of Malaria</i>			<i>Cases treated</i>	<i>Deaths</i>
—			—	—
Benign tertian	...	...	1,060	18
Quartan	...	...	150	7
Subtertian	...	...	2,057	238
Mixed	...	...	482	17
Chronic	...	...	272	4
Unclassified	...	...	1,553	—
			<hr/> 5,574	<hr/> 284

Blood examination is adopted in all cases of fever and the total number of specimens examined gave the following results.

Subtertian	...	...	...	2,123
Benign tertian	...	...	...	1,309
Quartan	...	...	...	166
Mixed	...	...	...	633
Negative	...	...	...	7,207
				<hr/> 11,438

6. *Dysentery*.—Five hundred and fifty-six cases were treated of which 224 died giving a death-rate of 40·18 per cent as compared with 33·71 per cent in 1926.

<i>Types of Dysentery</i>			<i>Cases treated</i>	<i>Deaths</i>
—			—	—
Amœbic	...	...	263	104
Bacillary	...	...	228	114
Chronic	...	...	10	—
Mixed	...	...	6	6
Unclassified	...	...	49	—
			556	224

7. *Beri-beri*.—The numbers again increased from 689 to 1,009 with 200 deaths giving a percentage death-rate of 19·82 per cent as compared with 16·54 per cent the previous year. Ninety-two cases died within 24 hours.

Comparative figures.—

	1920	1921	1922	1923	1924	1925	1926	1927
	—	—	—	—	—	—	—	—
Cases	136	297	730	483	416	623	689	1,009
Deaths	14	75	107	64	77	75	114	200
Mortality } Percent ae }	10	25·25	14·57	13·25	18·50	12·93	16·54	19·82

8. *Enteric Fever*.—Fifty-one cases were admitted, of these 28 were treated as such and 23 diagnosed post mortem. For those treated the death-rate was 42·82 per cent. Including all cases the death-rate was 69·97 per cent. Eleven cases died within 24 hours of admission.

9. *Pneumonia*.—Five hundred and forty cases with 372 deaths: 476 were of Lobar type with 318 deaths, a death-rate of 66·8 per cent, while 64 were of Broncho type with 54 deaths giving a death-rate of 84·37 per cent.

The average death-rate was 75·58 per cent. Seventy-six cases died within 24 hours. Excluding these the death-rate was 54·81 per cent. In addition 43 deaths were terminal Pneumonias in concurrent diseases, excluding these the death-rate was 46·85 per cent for purely Pneumonia cases.

10. *Venereal Diseases*.—One thousand four hundred and fifty-nine cases were treated with 22 deaths as compared with 1,635 cases the previous year.

			<i>Cases</i>	<i>Deaths</i>
			—	—
Syphilis congenital	...	...	1	—
„ visceral	...	...	11	11
„ primary	...	...	303	—
„ secondary	...	...	488	—
„ tertiary	...	...	83	11
Chancroid and bubo	...	...	252	—
Gonorrhoea Urethritis	...	...	124	—
„ and other manifestations	...	...	197	—
			1,459	21

Number of injections—

N. A. B.	...	55	Novarsan	...	69
Neo Salvarsan	...	1,458	Silver Salvarsan	...	147
Sulfarsenol	...	268	Tartar Emetic	...	48
Bicreol Bismostab	1,055		Contramine	...	459

Other drugs used were, Sulfoxyl Salvarsan, Novarsan, Salvarsan.

11. *Helminthiasis*.—All stools of patients were examined microscopically on admission. The results are appended:—

Ankylostoma Ova	...	...	...	4,861
„ and round worm ova	...	...	...	654
„ and whip worm ova	...	...	...	845
„ round and whip worm ova	...	...	...	377
Round worm ova	...	...	...	716
„ and whip worm ova	...	...	...	226
Whip worm ova	...	...	...	1,979
Amœbæ	...	...	...	39
No ova seen	...	...	...	6,675
				<hr/> 15,472 <hr/>

Percentage of infection with Ankylostomiasis	...	43·53 per cent
Percentage of infection with Round Worm	...	12·75 per cent

Total number of stools examined including repeated examinations were 17,214 as follows:—

Ankylostoma ova	...	...	...	5,322
„ and round worm ova	...	...	...	696
„ and whip worm ova	...	...	...	924
„ round and whip worm ova	...	...	...	389
Round worm ova	...	...	...	772
„ and whip worm ova	...	...	...	244
Whip worm ova	...	...	...	1,257
Amœbæ	...	...	...	39
No ova	...	...	...	7,571
				<hr/> 17,214 <hr/>

12. *Ankylostomiasis*.—There were 750 cases in which this infection was the principal disease with 5 deaths giving a death-rate of 66 per cent as compared with 95 per cent in 1926.

	Cases treated	Average No. of worms	Cure
	—	...	—
One dose Chemopodium	110	1,432	67
Two „ „	4	146	4
Mixed treatment	787	10,323	442
Ol Chenopodium one and Carbon tetrachloride one	27	463	12
Carbon tetrachloride one	1,190	11,406	964
„ „ two	48	1,073	29
„ „ three	5	159	5

13. *Tuberculosis*.—Seven hundred and fifteen cases were treated with 370 deaths giving a death-rate of 51·74 per cent as compared with 47·69 per cent in 1926.

14. *Ulcers*.—One thousand seven hundred and eighty-three cases were treated and the condition remains as intractable to treatment as formerly experienced. All recognised methods of treatment were adopted, and continuous eusol irrigation appeared to give the best results.

15. *Plague*.—One Bubonic case was transferred to Middleton Hospital

16. <i>Opium Habit.</i> —	Remained on 31st December, 1926	...	14
	Admitted during 1927	...	925
			<hr/> 939
	Discharged for breaking rules	...	19
	Unfit for treatment	...	1
	Discharged apparently cured	...	553
	Absconded	...	359
	Remaining 31st December, 1927	...	7
			<hr/> 939

17. *Medico-Legal.*—Two hundred and twenty-eight cases were sent by the Coroner for post mortem examination, and 25 died on the way to hospital. One thousand nine hundred and sixty-nine cases were brought by the Police for treatment. Two hundred and seventy-one cases were sent for observation for insanity, of which 146 cases were certified.

18. *General.*—The number of admissions is steadily on the increase and if continued additional accommodation will be required. Electric light was installed during the year.

19. *Dressers.*—The staff was increased by 20 dressers—

Passed for Grade II	...	...	...	8
Passed for Grade III	...	...	...	11
Passed Special Laboratory Course	...	...	...	14

20. Dr. E. D. LINDOW was in charge from 1st January to 2nd June, 1927.

Dr. J. C. CARSON was in charge from 3rd June to 31st December, 1927.

The surgical duties were performed by Mr. J. A. W. EBDEN, M.D., M.S., F.R.C.S., from 1st January, 1927 to 25th March, 1927 and by Mr. A. D. WRIGHT, M.S., F.R.C.S., from 26th March, 1927 to end of the year.

Miss M. J. S. INNES was appointed Matron in August 1926.

APPENDIX "G"

TREATMENT OF SCABIES BY THE DANISH METHOD

A return of uncomplicated cases of Scabies treated by the Danish Method in hospitals and dispensaries in the Straits Settlements, during 1927, is attached.

Conclusions are:—

- (1) That most sufferers are cured by a single application.
- (2) That the method does not require so much attention to detail as the Sulphur ointment treatment.
- (3) That these considerations render it specially suitable to out-door cases who will probably only make one attendance at a dispensary.
- (4) That in cases treated as in-patients the time spent in hospital is reduced to half (average about five days, instead of over ten with Sulphur ointment treatment).

Scabies in-patients treated by the Danish Method:—

—	Total number treated.	Cured first application	Cured second application	Cured No. of applications stated	Left before Cured
Government Hospitals	635	240	152	162	80

2. Treated in out-door dispensaries including Travelling dispensaries—2,985.

Very few of these cases returned a second time. It may be hoped that the majority were cured by a single application.

APPENDIX "H"

REPORT ON THE TREATMENT OF OPIUM HABIT

I.—SINGAPORE

REPORT ON PATIENTS RECEIVING TREATMENT FOR OPIUM HABIT
DURING 1927, BY J. C. CARSON, M.B., B.Ch., B.A.O.

Opium Habit—

Remained on 31st December, 1926	...	...	14
Admitted during 1927	...	...	925
			<hr/> 939 <hr/>
Unfit for treatment	...	...	20
Absconded	...	...	359
Discharged, apparently cured	...	...	553
Remianing on 31st December, 1927	...	...	7
			<hr/> 939 <hr/>

The number of genuine cases seeking admission continues to decrease. The same lines of treatment were adopted, but the results obtained were disappointing, as about half of the patients absconded, and of the others very few exhibited any real distress following eradication of the drug. Twelve patients were admitted twice and three patients three times.

II.—PENANG

REPORT ON ANTI-OPIUM TREATMENT BY R. B. MACGREGOR, M.B., Ch.B.

Thirty beds have been reserved for the treatment of sufferers from opium smoking during the year. The number of patients, 406, treated during the year was much reduced as compared with the previous year. Of the number treated, 124 were cured, 270 absconded, 2 were unfit for treatment and 10 remained on 31st December, 1927.

III.—MALACCA

REPORT ON ANTI-OPIUM WARDS BY E. D. LINDOW, M.R.C.S., L.R.C.P.

Anti-opium treatment.—Facilities for anti-opium treatment were provided and were made known with the help of the Assistant Protector of Chinese, but only a few took advantage of them.

The total number treated during 1927 was 96. Of these only 7 completed the course. 88 absconded. No information is available regarding the history of the patients who had anti-opium treatment last year, but in my opinion, most of the patients took treatment for the sake of a "Resy Cure" or in order to reduce their consumption of opium for financial reasons. They are very few cases who have been really cured.

APPENDIX "I"

OUT-PATIENTS TREATED DURING THE YEAR 1926, AT THE WOMEN AND CHILDREN'S DISPENSARY, KANDANG KERBAU, SINGAPORE

REPORT BY MRS. C. H. DUKE, M.B., D.P.H.

The number of patients treated during the year was as follows:—

<i>New patients</i>	<i>Repetitions</i>	<i>Total</i>
—	—	—
14,124	19,746	33,888

The corresponding figures for 1926 were:—

<i>New patients</i>	<i>Repetitions</i>	<i>Total</i>
—	—	—
12,767	19,480	32,247

Nationalities.—

Chinese ...	...	...	...	...	10,236
Eurasians	...	...	...	...	741
Indians	...	...	...	...	1,767
Malays ...	...	...	...	...	982
Jews ...	...	...	..	...	210
Japanese	...	...	...	...	110
Others ...	...	...	...	...	78
					<hr/> 14,124 <hr/>

Venereal Disease.—There were 465 cases of venereal disease with 4,139 attendances. ...

These consisted of—

Syphilis	...	...	..	...	195
Congenital Syphilis	...	...	...	...	29
Gonorrhea	...	...	...	...	199
Syphilis and Gonorrhea	...	...	...	...	26
Gonorrheal Ophthalmia	...	...	...	...	16
Total ...					<hr/> 465 <hr/>

In 1926 there were 855 cases with 5,011 attendances.

Injections for venereal disease were:—

N. A. B.	...	...	...	...	955
Sulfarsenol	...	...	..	...	144
Gonorrheal Vaccines	...	...	...	...	132
					<hr/> 1,231 <hr/>

Eight hundred and ninety-seven injections were given in 1926.

Fevers.—There were 594 cases of malaria in 1927 as compared with 362 in 1926 and 132 in 1925.

B. T. ...	...	...	...	...	554
S. T. R. ...	...	...	...	...	36
Quartan	...	...	...	...	4
Mixed infection	...	...	...	...	—
					<hr/> 594 <hr/>
Unspecified Fevers ...	...	...	...	...	584
Ankylostomiasis cases	...	...	...	...	3
Beri-beri cases	...	...	...	...	6
Leprosy cases	...	...	...	...	7
Phthisis cases	...	...	...	...	48
Yaws cases	...	...	...	...	1
The Microscopical Examinations numbered	...	...	...	...	2,218

APPENDIX "J"

REPORT BY PROFESSOR J. S. WEBSTER, M.B., B.S., D.P.H. AND D.M.R.E.,
RADIOLOGIST, SINGAPORE

The year 1927 was one of continued progress for the department. The work has continued to increase as instanced by the number of radiograms taken which increased from 4,747 in 1926 to 6,118 in 1927. In November the new equipment arrived and was quickly installed so that Singapore can now challenge comparison with any hospital. The new equipment embodies the most complete protection for the patient and operator that the X-Rays and Radium Protection Committee advise, and has been passed by the National Physical Laboratory. In addition, the equipment for a small Light section has been obtained and is in full use.

The total number of radiograms taken during the year was 6,118 and these comprise the following:—

Examinations after an Opaque meal	...	...	269
„ „ „ „ enema	...	...	13
„ „ „ „ swallow	...	...	8
„ of Chest, Ribs or Clavicle	...	...	294
„ „ Skull, face (not sinuses)	...	...	115
„ „ Sinuses	...	...	80
„ „ Abdomen	...	...	53
„ „ Kidneys and Urinary tract	...	...	123
„ „ Pelvis and Bladder	...	...	122
„ „ Hip Joint	...	...	112
„ „ Spine	...	...	110
„ „ Scapula	...	...	13
„ „ Mandible	...	...	15
„ „ Teeth	...	...	179
„ „ Gall Bladder (Cholecystography)	...	...	39

In addition to cholecystography, the results of which are not ready for publication in view of the small number of cases, pyelography has been undertaken in three cases. Also X-Ray examinations after the injection of Lipiodal have also been commenced.

Therapeutic X-Rays.

The following diseases were treated:—

Uterine fibroids (7), Exophthalmic Goitre, Lupus Vulgaris, Lupus erythematosus, Sarcoma of bone (5), Tuberculous Adenitis, Acne and Tinea.

In the electrical branch, all the diseases usually treated in such a department have been met with here. During the year a set of radiant heat baths was obtained and has proved useful.

APPENDIX "K"

I.—MEDICAL INSPECTION OF ENGLISH GIRLS' SCHOOL, SINGAPORE

Report by Inspector of Girls' Schools (Dr. C. H. DUKE, M.B., D.P.H.)

Six schools were examined during the year, namely—

Fairfield School

Methodist Girls' School

French Convent School

Raffles Girls' School

Saint Anthony's Convent School

Singapore Chinese Girls' School.

The pupils numbered 2,935 as compared with 2,586 in 1926.

Developments.—The results obtained during 1927 all point to the fact that the medical examinations are beginning to tell in the general all round improved physique of the school children.

The general nutrition is of a higher standard. 5/6% were below the average as compared with 23% in 1926.

Unsatisfactory clothing was 1 $\frac{3}{4}$ % as compared with 10 $\frac{1}{2}$ % in 1926.

Pediculi Capitis and Nits percentage was 3%, whereas in 1926 it was 6%, showing a decrease of 50%.

Vaccination.—Fourteen and a half per cent required re-vaccination as compared with 31% in 1926 and of these 88% were vaccinated at school.

Anæmia.—Ten and a half per cent as compared with 14% in 1926 showing only a slight improvement. This condition is met with chiefly amongst the older girls.

Skin affections.—Seven and three quarter per cent as compared with 10% in 1926 again showing generally a slight improvement.

Defective vision.—Three per cent required glasses as compared with 4% in 1926. But only 21 1/3% of these had their eyes further examined and glasses supplied, whilst in 1926 67% were fitted with glasses. Those with defective vision should be strongly urged to procure glasses.

Bad teeth.—Thirty-nine per cent as compared with 37% in 1926, thus showing a slight increase. Only 32 $\frac{3}{4}$ % visited the dentist and showed improvement. Last year 34 $\frac{1}{4}$ % received treatment. Altogether the response to advice for treatment is bad and requires greater encouragement.

Sanitation.—This in the majority of schools is now fairly satisfactory.

Food.—On the whole the food now supplied at the schools is cleaner, slightly more wholesome and more closely supervised.

Children attending the Dispensary from the various schools during 1927 were:—

Fairfield School	...	...	...	15
French Convent School	...	...	...	101
Methodist Girls' School	...	...	...	97
Raffles Girls' School	...	...	...	12
Saint Anthony's Girls' School	...	...	...	55
Singapore Chinese Girls' School	...	...	...	18

II.—ANNUAL REPORT FOR 1927 ON BOYS' SCHOOLS IN SINGAPORE,

BY DR. K. C. GHOSH, ASSISTANT HEALTH OFFICER, SCHOOLS, SINGAPORE

The following schools were visited during the year 1927 and Sanitary Reports made in the school-diary or separate reports furnished to the Inspector of Schools.

(1) <i>Government and Aided Schools</i>	<i>Total Examined</i>	<i>Visits</i>
—	—	—
(a) Gaylang English School	...	10
(b) Outram Road School	...	20
(c) Pearls Hill School	...	19
(d) Raffles Institution	...	10
(e) Rangoon Road School	...	18
(f) Radin Mas School	...	15
(g) Telok Kurau English School	...	9
(h) Victoria Bridge School	...	25
(i) Anglo-Chinese School	...	26
(j) Gan Eng Seng School	...	16
(k) Holy Innocents School	...	7
(l) Paya Lebar School	...	11
(m) Serangoon Road School	...	3
(n) St. Anthony's Boys' School	...	21
(o) St. Joseph's Institution	...	22
(p) St. Andrew's School	...	17
(2) <i>Vernacular Malay Schools (Government)</i>	<i>Total Examined</i>	<i>Visits</i>
—	—	—
(a) Kampong Glam Malay School	...	17
(b) Rochore Malay School	...	19
(c) Kampong Rokok Malay School	...	9
(d) Gaylang Malay School	...	9
(e) Tanjong Katong Malay School	...	7
(f) Telok Kurau Malay School	...	14
(g) Siglap Malay School	...	9
(h) Padang Terbakar Malay School	...	6
(i) Beting Kusa Malay School	...	6
(j) Pulau Tekong Malay School	...	3
(k) Tanglin Kechil Malay School	...	12
(l) Tanglin Besar Malay School	...	7
(m) Sepoy Lines Malay School	...	7
(n) Telok Blangah Malay School	...	13
(o) Kampong Jagoh Malay School	...	6
(p) Pasir Panjang Malay School	...	3
(q) Telok Saga Malay School	...	8

(3)	Private Schools	Total Examined	Visits
	—	—	—
(a)	Oldham Hall School ...	—	1
(b)	River Valley Road School ...	—	1
(c)	The Christian School ...	—	1
(d)	Katong Chinese Boys' School ...	—	1
(e)	Mrs. E. S. Smith's School ...	—	1
(f)	Malaysian Union Seminary ...	—	2
(g)	Alsagoff's Arab School ...	—	1
(h)	The Plainfield School ...	—	3
(i)	The Indian Elementary School ...	—	2
(j)	Anglo-Vernacular School ...	—	2
(k)	Dutch Preparatory School ...	—	1
(l)	The Elementary English School ...	—	2
(m)	Royal English School ...	—	7
(n)	The Mercantile Institute ...	—	1
(o)	Serangoon Private School ...	—	1
(p)	New Arab School ...	41	4
(q)	Anglo-Tamil School ...	—	1
(r)	Primary English School ...	—	1
(s)	Alexander English School ...	—	1
(t)	St. Andrew's Medical Mission School	—	3
(u)	Newton School ...	—	1
(v)	Le Mercier's School ...	—	6
(w)	Pasir Panjang School ...	—	1
(x)	Christian Tamil School ...	—	1
(4)	Girls' School	Total Examined	Visits
	—	—	—
(a)	Convent ...	—	3
(b)	Portuguese Convent ...	—	3
(c)	Singapore Chinese Girls' School	—	2
(d)	Fairfield Girls' School ...	—	5
(e)	Raffles Girls' School ...	—	4
(f)	Nind Home School ...	—	2
(g)	Methodist Girls' School ...	—	4
(h)	Gaylang Chinese Methodist Girls' School ...	—	1

The Girls' Schools were visited for the following purposes:—

- (a) Drawing up of Plans of School with classroom measurements, external opening, etc.
- (b) Issue of Medical Certificates under Regulation 12.
- (c) To see if they have weighing machines

2. *Medical Examination of Boys.*—The total number of boys examined individually was 7,119.

3. *General Condition.*—I have divided up the boys examined into Good, Fair, Poor and Fat. The number in each category are Good 5,682; Fair 992; Poor 199; and Fat 246.

The following are the percentages of each for the last three years:—

	1925	1926	1927	
	—	—	—	
Fat ...	...	...	3.46%	} 83.4%
Good ...	78 %	81 %	79.81%	
Fair ...	13.3%	11.9%	13.93%	
Poor ...	11.1%	3.7%	2.80%	

4. *Cleanliness*.—All headmasters have been instructed to see that the boys have a bath before coming to school, otherwise they are either bathed in school or sent home for a bath; that the nails are cut short; hair well-kept; and clothes clean. There are few cases of dirty children in school now. I have examined the boys of the Malay Schools at every visit to see that the teachers were carrying out instructions and am glad to say that there is a great improvement in the care of the boys. The teachers too have begun to take more interest in the health of their boys. The percentage of dirty children is only 3.19%, as compared with 21.76% in 1923 and 7.82% in 1926 of the Gan Eng Seng School.

5. *Vaccination*.—This was done by the Vaccinator attached to the Health Office. His figures are given below. The total number vaccinated was 3,832 as against 1,162 in 1923 and 3,260 in 1926.

English Schools vaccinated	...	...	2,559
Malay Boys' Schools vaccinated	...	...	1,025
Malay Girls' School vaccinated	...	...	47
Reformatory School vaccinated	...	...	138
Chinese Private School vaccinated	...	...	62

6. *Eye-sight*.—(1) Defective Vision and
(2) Diseases of the Eye proper.

The total number examined was Defective Vision	...	568 cases
Diseases of the Eye	...	313 „

Those with the defects greater than 6/9 were asked to see a local optician and to get glasses.

Under the second category were—

(a) Follicular Conjunctivitis	...	...	74 cases
(b) Acute Conjunctivitis	...	..	11 „
(c) Sub-acute Conjunctivitis	...	..	1 case
(d) Cataract and Dislocation Lens	...	...	1 „
(e) Trachoma	...	...	147 cases
(f) Proptosis	...	..	3 „
(g) Squint or Strabismus	...	..	26 „
(h) Tic of Eye-Lids	...	...	1 case
(i) Meibomian Cyst	...	..	2 cases
(j) Blepharitis	...	..	21 „
(k) Ectropion	...	..	5 „
(l) Chalazion	...	...	1 case
(m) Dense Leukoma	...	..	1 „
(n) Conjunctivitis	...	..	1 „
(o) Leukoma	...	...	9 cases
(p) Corneal Opacity	...	..	2 „
(q) Black eye	...	...	1 case
(r) Blind (Left)	...	..	2 cases
(s) Styte	...	...	1 case
(t) Swollen Eye-Lids	...	...	1 „
(u) Nebula Cornea	...	...	1 „

These cases were sent for treatment either to the General Hospital or to an Out-door Dispensary.

7. *Dental Caries*.—The percentage of caries amongst school children is 51.68% and the school dentist attends to these as arranged. The number of boys examined for dental caries was:—

1925	...	...	2,791 boys—1,323 caries	...	47 %
1926	...	...	5,338 boys—3,340 caries	...	62.6 %
1927	...	...	7,119 boys—3,579 caries	...	51.68%

8. *Sanitation*.—

Visits to Schools.—The number of visits was 444 as against 26 in 1925 and 139 in 1926. Reports and recommendations were submitted to the Inspector of Schools through Sanitary Report forms or entries in the school-diaries.

9. *Infectious Diseases*.—

1. *Measles*.—There were 14 cases from different schools.
2. *Chicken-pox*.—There were nine cases from different schools.
3. *Diphtheria*.—There were two cases from different schools and one of these was a teacher. Thirty-three boys of one class were given prophylactic injections.
4. *Leprosy*.—There was one case.
5. *Mumps*.—There were four cases.
6. *Psoas Abscess*.—There was one case.
7. *Typhoid Fever*.—There were three cases.
8. *Yaws*.—There were six cases.

10. *Examination of Boys for Standard Age, Height, Weight and Nationality*.—All the Government, Aided, and Vernacular School Boys were individually examined and standard boys picked out. Lists of such boys with their Ages, Heights, Weights, and Nationality were submitted to the Health Officer, Schools.

During this examination teachers were shown cases of early spinal defects and told how to correct and prevent them.

11. *Lantern Lectures*.—Twenty-seven slides were shown and a short lecture on each given at the following schools:—

1. Outram Road School.
2. Radin Mas School.
3. Anglo-Chinese School (III to V standards only).
4. St. Anthony's Boys' School.
5. Royal English School.
6. Plainfield School.
7. Rochore Malay School.

12. *Lectures*.—Lectures on the following—Sleep, bath, food, teeth, exercise, clothes, posture, sun and air, diseases and treatment were given to the following schools:—

1. Gaylang Malay School.
2. Tanglin Kechil Malay School.
3. Rochore Malay School.
4. Telok Kurau Malay School.
5. Kampong Glam Malay School.

13. *Travelling Dispensary*.—This has been visiting the Vernacular Schools on its routes and giving treatment to the boys free of charge. Headmasters have been asked to co-operate with the Dispensary.

IV. MALACCA

Schools.—All the Schools were visited during the year and pupils were treated according to their ailments—

Yaws	...	...	...	194
Malaria	...	...	...	38
Scabies	...	...	...	96

V.—GOVERNMENT SCHOOLS, LABUAN

All boys in Government Schools were systematically examined and treated.

The following table represents the results of one such examination in chief:—

	Grand Total	Total medical examination	Spleen enlarged	Liver enlarged	Bad Teeth	Tonsils	Defective Vision	Disease Ear	Disease Eye	Disease Heart	Disease Respiratory	Disease Skin	Hookworm Ova	Round Worm Ova	Whip Worm Ova
English School ...	96	96	1	...	32	26	8	...	...	...	1	7	27	35	22
Bukit Kallam School...	45	42	17	1	9	14	1	...	...	...	...	9	31	25	4
Malay Town School ...	97	97	5	1	7	30	2	...	4	...	2	1	32	43	28
Grand Total ...	238	235	23	2	48	70	11	...	4	...	3	17	90	103	54
Percentage 1927 ...	...	98.7	9.78	1.7	2.04	29.78	4.68	...	1.7	...	1.27	7.23	38.3	43.8	23.0
Percentage 1926 ...	...	92.82	13.81	...	28.17	36.46	2.20	.5	1.0	.5	...	1.6	48.61	68.50	49.17

The above table shows a larger percentage of boys examined in 1927, a diminution in the spleen rate, dental caries and tonsil and worm infections compared with year, 1926.
A corresponding improvement in the physique of all school boys was noteworthy, and due in great measure to greater attention to detailed and organised sport in which the "Scout Movement" played an important part.

APPENDIX "L"

SOCIAL HYGIENE BRANCH

ANNUAL REPORT BY W. M. CHAMBERS, M.D., L.R.C.P., L.R.C.S.,

*Chief Medical Officer, Social Hygiene.*1. *Facilities for treatment.*—

The following Government Clinics are open daily (except Sundays) for the free treatment of all nationalities in Singapore:—

A. *Male Clinics.*—

1. Bencoolen Street V. D. Clinic.
2. North Canal Road V. D. Clinic.
3. Tanjong Pagar V. D. Clinic.
4. General Hospital V. D. Clinic.
5. Kandang Kerbau Out-door Dispensary.
6. Joo Chiat Road Out-door Dispensary.
7. Bukit Timah Out-door Dispensary.
8. Paya Lebar Out-door Dispensary.

B. *Female Clinics.*—

1. Kandang Kerbau Women's Out-door Dispensary.
2. Bencoolen Street V. D. Clinic.
3. North Canal Road V. D. Clinic.

C. *Hospitals.*—

1. General Hospital (Males and Females).
2. Tan Tock Seng's Hospital (Males).
3. Mandalay Road Women's Hospital.

The evening sessions held between 6 P.M. and 8 P.M. at three of the Clinics have proved popular and have enabled those who attend work during the day to obtain necessary treatment.

All examinations and treatment in the female Clinics are carried out by a qualified Chinese Lady Assistant Surgeon.

Treatment of Seamen.—The Clinic at Tanjong Pagar caters for men of the Mercantile Marine and conforms to the International Agreement by treating seamen of all nationalities free of charge and providing them with sufficient therapeutic agents for treatment during the voyage to the next port of call.

Number of Seamen treated.—

New cases	...	...	...	...	879
Total attendances	...	...	...	...	3,976

Nationalities of Seamen treated.—

British	...	...	...	...	243
Belgian	...	...	...	...	1
Norwegian	...	...	...	...	7
French	...	...	...	...	3
Danish	...	...	...	...	16
Russian	...	...	...	...	3
American	...	...	...	...	11
Swedish	...	...	...	...	2
Dutch	...	...	...	...	2
Australian	...	...	...	...	1
German	...	...	...	...	1
Chinese	...	...	...	...	507
Malays	...	...	...	...	35
Indians	...	...	...	...	32
Others	...	...	...	...	15
					<hr/> 879 <hr/>

2. Number of attendances at the Singapore Clinics.—

	NUMBER OF NEW CASES ONLY															
	Sy. I		Sy. II		Sy. III		Cong. Sy.		Soft Sore		Gon.		Bubo		Other V. D.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Europeans	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chinese	46	...	53	...	1	...	...	...	55	...	198	...	36	...	48	...
Malays	1,779	55	1,782	67	385	329	12	28	808	...	1,394	...	1,900	65	414	127
Indians	76	2	180	12	30	28	...	...	21	...	243	...	55	1	54	26
Others	554	...	432	6	86	19	3	...	292	...	689	...	381	4	188	...
	58	...	60	4	5	17	...	2	39	...	121	...	40	...	37	8
Total	2,513	57	2,507	89	507	393	15	30	1,305	...	2,645	427	2,412	70	741	161
	14,106															

Total attendances including new cases.—

	NUMBER OF ATTENDANCES INCLUDING NEW CASES															
	Sy. I		Sy. II		Sy. III		Cong. Sy.		Soft Sore		Gon.		Bubo		Other V. D.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Europeans	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chinese	366	...	577	...	16	...	...	...	140	...	2,942	18	180	...	102	...
Malays	11,024	323	7,820	296	1,592	2,954	39	161	6,566	...	12,475	1,679	11,357	320	1,181	148
Indians	772	12	488	41	84	205	...	3	122	...	3,521	235	472	4	134	70
Others	6,975	27	2,428	15	370	134	3	...	3,776	...	10,960	216	5,562	6	540	12
	1,202	4	687	12	88	159	...	12	598	...	3,386	192	819	2	79	29
Total	20,339	366	12,000	364	2,150	3,452	42	176	11,202	...	33,284	2,340	18,390	332	2,036	259
	108,087															

A comparison with the previous year shows a large increase:—

	1926		1927		1926		1927		1926		1927	
	Males	Females	Males	Females	Males	Females	Males	Females	Total	Total	Total	Total
New cases	...	...	...	...	...	...	...	...	...	...	...	...
Re-attendances	...	...	...	...	...	...	...	...	...	...	...	...
	7,284	1,944	12,840	1,266	9,228	14,106	...	...	...	...	...	...
	30,019	4,881	87,857	6,124	34,900	93,981	...	...	...	...	...	...
Total, attendances	37,303	6,825	101,697	7,390	44,128	108,087	...	...	...	...	...	...

Ratio of total attendances to new cases.—The ratio of attendances to new cases shows a satisfactory increase over the previous year being 7.66 for 1927 as compared with 4.76 for 1926. The ratio is higher in the purely V. D. Clinics such as Bencoolen Street and Tanjong Pagar Clinics than in Clinics attached to Out-door Dispensaries.

3. *Treatment by Private Practitioners.*—

During the year a number of private practitioners treated poor patients at reduced fees with therapeutic agents supplied by the Government.

The numbers so treated were:—

	<i>Syphilis</i>	<i>Genorrhœa</i>	<i>Total</i>
	—	—	—
New cases ...	1,352	193	1,545
Re-attendances ...	2,281	850	3,131
	—	—	—
Total attendances ...	3,633	1,043	4,676

4. *Blood examinations.*—The Professor of Bacteriology has examined by the Kahn test specimens of blood sent from all the Clinics, at the Laboratory of the King Edward VII College of Medicine with the following results:—

<i>No. of blood tests</i>	<i>Positive</i>	<i>Negative</i>
—	—	—
3,628	1,756	1,872

Arrangements were made during the year for the free examination of the blood of poor patients seen by private practitioners.

5. *Analysis of work done at the Clinics:*—

1. *Injections.*—

(a) *Intravenous*—

(i) Arsenobenzol	...	...	14,107
(ii) Collosal Iodine	...	...	1,257
(iii) Acriflavine	...	...	14
(iv) Mucurosol	...	...	284
(v) Tincture Iodine	...	...	15

(b) *Intramuscular*—

(i) Bismuth	...	...	13,836
(ii) Trimine	...	...	348
(iii) Thiostab	...	...	89
(iv) Intramine	...	...	—
(v) Contramine	...	...	330
(vi) Collosal Manganese	...	...	568
(vii) Gonoyatren	...	...	139
(viii) Gonorgin	...	...	24
(ix) Bandœng Vaccine	...	...	1
(x) Manganese Butyrate	..	...	84

(c) *Hypodermic*—

(i) Vaccine	...	...	4,749
(ii) Sulfarsenol	...	...	2,826
(iii) Sulphostab	...	...	32
(iv) Protein Shock	...	...	3
(v) Serobacterin	..	...	70
(vi) Sod. Theosulphate	...	...	13

2. *Instrumentations, &c.*—

(i) Irrigations	...	...	36,746
(ii) Dressings	...	...	52,764
(iii) Prostatic Massage	...	...	2,407
(iv) Minor Operations	..	...	336
(v) Dilatation	...	...	314
(vi) Urethroscope	...	...	23

3. *Microscopical Examinations.*—

Gonococci	...	...	+ 2,695
			— 1,630
			—
			4,325

6. *Propaganda*.—

The recommendations of the Advisory Committee on Social Hygiene have been closely followed in the programme of propaganda carried out with a view to educating the public on the subject of venereal disease.

The various philanthropic bodies have shown a keen desire to help in the dissemination of information and have rendered valuable assistance.

Pamphlets and leaflets were published by the Social Hygiene Office and about 90,000 copies have been distributed in English, Chinese, Malay and Tamil.

Posters on the subject of V. D. and advertising the Clinics were posted daily throughout the streets of Singapore.

Cinema films.—Two films were exhibited—one “Youth and Life” kindly lent by the British Social Hygiene Council and another, “Social Hygiene for Men” kindly lent by the League of Red Cross Societies, Paris. These films were shewn on 18 occasions to about 15,000 people of all nationalities in Singapore.

Chinese Lady Visitor.—On the recommendation of the Social Hygiene Advisory Board a Chinese Lady Visitor was engaged to carry out propaganda amongst women. She commenced work on 1st October, 1927. She has given informal lectures, and has distributed specially prepared leaflets, to Chinese women with a view to bringing those who require treatment under proper medical care.

7. *General*.—

In its propaganda activities the Social Hygiene Branch has received valuable assistance in the form of propaganda material and information from the British Social Hygiene Council, the League of Red Cross Societies, Paris, the United States Public Health Service, Washington, the German Society for Combatting Venereal Diseases, Berlin, the Museum of Hygiene, Dresden, and the Council on Health Education, Shanghai.

APPENDIX “M”

REPORT OF BIOLOGICAL DEPARTMENT

BY PROFESSOR K. B. WILLIAMSON, *Professor of Biology, College of Medicine, Singapore.*

The work and progress of the department, departmental, and subsidiary research staff may be conveniently summarised under the following heads.

Equipment.—The major part of the apparatus and material purchased from the balance of the equipment grant supplemented from the grant for annual expenditure, came to hand at the beginning of the 1927/28 Session (May). Besides purchases through Crown Agents the department was equipped locally with tables, a stand for growing plants, and insect cages. These together with the aquaria have proved invaluable by enabling living material to be kept on hand for class work, and, by providing objects of interest to individual students. The atmosphere of a laboratory is apt to be arid, especially for beginners, and the habit of spontaneous observation is probably more valuable than what is learned merely for examinations and soon forgotten. It was therefore gratifying to notice that members of the First Year Class often examined the temporary and permanent exhibits with evident interest.

Teaching.—In accordance with ideas discussed with Colonel Needham, who strongly endorsed the need for modifying the curriculum of British

Colleges to suit local needs and those of Medical training so as to utilise local material,

- (1) An insect type (the cockroach) was introduced for detailed study in place of the Grayfish, with subsidiary observations and instructions on mosquitoes.
- (2) Mammalian osteology was introduced into the course, almost all the students who passed acquitting themselves well in the subject.
- (3) Students were practised in fixing and staining animal as well as vegetable tissues belonging to the types they dissected, and were made acquainted with the use of the Giemsa stain and some other stains they will need to use in later years. This added interest to the work without making any appreciable demands on time, and is, I believe, justified by the fact that slip shod method if once learned may take years to eradicate.
- (4) Some idea of the local fauna and flora was gained during excursions, the names of some of the commoner trees, flowers and butterflies and other insects being learned, and eagerly asked for by students. Most, if not all, showed very keen interest in what they saw, and although some of the knowledge thus acquired is technically unimportant the habit of, and interest in, observing is likely to be useful in later life especially when applied to problems of tropical parasitology. There is a great danger however of interest in, and with it the habit of, outdoor observations ceasing and of the whole of the biology learned in the first year being forgotten if zest is not fostered during the later stages of study. The meetings of the Natural History Society, dealt with below, help to this end.
- (5) In order to give effect to these ideas in the First Year of study less stress has been laid upon purely academic questions, and details of no relevance to medical studies such as these relating to the comparative morphology of plants, etc., such questions being either beyond the comprehension of elementary students, or serving merely to cram their minds with quite useless and artificial knowledge, by which they are tempted to judge the value of all the rest.

Natural History Society.—The permission granted to the Singapore Natural History Society to hold its meetings in the College, is greatly appreciated by the members and the general public and enables students who are interested to attend.

Research, and Subsidiary Research Staff.—A month's tour of Malacca was made in May 1927 for the purpose of studying the relation of Malaria to the different types of soil and water and the anophelene species prevalent on or in them. Collections of spleen record were made on almost every day of the month, soils being brought back for analysis.

This line of research has been continued in relations to local conditions with the help and co-operation of Professor Rosedale.

During the latter half of the session of the Port Health Officer Dr. J. W. SCHARFF, allotted Mr. HASSAN (part time) to assist in experiments upon local mosquitoes.

The connection with the Fisheries' Department, which in the previous year was confined to the latter sending two of its staff to attend the Biology Classes, was modified in a direction which, if pursued, should lead to mutually profitable co-operative research, this being possible owing to the similarity of the bio-chemical problems respectively related to the survival of mosquito larvae, and the native fish in inland waters. Accordingly as a result of discussion with Mr. BIRTWISTLE and with Mr. GREEN, the late Director of Fisheries, and with the approval of the Acting Principal, it was arranged that Mr. JASINGHE, the above department's laboratory assistant, should work

in this laboratory when he could be spared from his other duties. A start was made in November.

Permanent Staff.—Mr. V. NATHAN, continues to perform the duties of laboratory assistant very satisfactorily.

Personal.—I remained in charge of the library during the first two terms of the session, after which the Acting Principal made arrangements entailing the services of a member of the staff.

A garden with a few shrubs, etc., was planted and maintained by me on the waste land outside my late residence. The plants, and equally the insects visiting them were keenly observed during visits of the class.

The following scientific papers written during the period of report have been accepted for publication as detailed below:—

- (1) Mosquitoes and Malaria in relation to the nitrogen cycle (Bulletin of Entomological Research).
- (2) The Chemistry of Anopheline-breeding waters in relation to organic and other factors, and improved methods of control-transaction (The Far Eastern Association of Tropical Medicine).

APPENDIX "N"

ANNUAL REPORT

OF THE

SECTION OF BACTERIOLOGY

KING EDWARD VII COLLEGE OF MEDICINE, SINGAPORE

FOR THE YEAR 1927

BY W. ARTHUR YOUNG, M.R.C.S., L.R.C.P., M.P., B.S., *Professor*
of Bacteriology

A. Routine examinations carried out in the department for General Hospital, Social Hygiene Clinics, etc.

Total numbers

1. *Serological Examinations.*—

(1) Kahn's Tests	...	...	...	4,446
(2) Wassermann Reactions	...	...	...	73
(3) Sigma Reactions	...	...	...	57
(4) Agglutination Reactions	...	...	...	2,422
(Typhoid Group, Dysentery, Weil-Felix, Malta Fever, etc.)				

2. *Bacteriological Examinations.*—

(1) Faeces	...	...	...	311
(2) Urine	...	...	...	189
(3) Cerebro-Spinal Fluids	...	...	...	22
(4) Sputum	...	...	...	32
(5) Pathological Exudates	...	...	...	63
(6) Throat Swabs	...	...	...	54
(7) Blood Cultures	...	...	...	59
(8) Simple Smear Preparations	...	...	...	93
(9) Miscellaneous	...	...	...	28
3. Vaccines prepared	...	...	...	31
4. Animals inoculated	...	...	...	6
5. Animal Post Mortems	...	...	...	8
6. Sections cut	...	...	...	37

Grand Total ... 7,931

B. General Remarks.—

The period under review has been one of transition, the laboratory only being under my charge for the last eight months of the year.

The most important items of the work carried out have been the training of staff, general organisation of a new department, the collection of representative strains of the commoner organisms for teaching purposes, the breeding of a healthy stock of animals for experimental purposes, and the institution of lines of research commensurate with the present staff and equipment of the department.

The routine work of the department has shown a considerable increase in the last half of the year due principally to improved co-operation with the clinical staff of the hospital. The simple examinations have largely been relegated to the Clinical Laboratory of the General Hospital.

APPENDIX "O"

REPORT OF THE BIO-CHEMICAL DEPARTMENT, KING EDWARD VII COLLEGE OF MEDICINE, SINGAPORE.

By J. L. ROSEDALE, P.H.D., D.SC., F.I.C., *Professor of Bio-Chemistry.*

Systematic courses of lectures and practical work in organic chemistry and Bio-chemistry were given throughout the year to students preparing for the second professional examination.

Research, in this department is being devoted to local food problems. As most of the energy-producing foods are imported into the country, systematic investigation is being undertaken of such Malayan-grown fruits and vegetables as are likely to give satisfactory vitamin and mineral supplements to diets which are largely based upon rice. Some of the commoner constituents of curry mixture are similarly being studied.

Typical native diets are under examination by means of feeding experiments and it has been observed that some of these render a lowered resistance to lung troubles, apparently on account of a shortage of suitable fats. In this connection the effect of direct sunlight upon certain vegetable oils gives an indication of promise.

Chemical analysis (including the principal mineral elements) of the various Malayan foods is being made, and the chemical constitution of proteins of fish is being compared with that of meat.

APPENDIX "P"

REPORT OF INFANT AND CHILD WELFARE WORK IN THE RURAL DISTRICT OF SINGAPORE

BY

I. M. M. SIMMONS, S.R.N., H.V.D., *Health Sister.*

This branch of Health Work was started by the Government Health Department in May, 1927.

Staff.—Two Health Sisters.

Chinese Amah as Interpreter (since July only).

Their duties include visiting as far as possible all newly born children, and pre-school children, supervising the work of midwives, visiting and advising mothers in all matters relating to their own and their children's health, and advising and assisting them to obtain medical assistance when necessary.

The Chinese Amah is untrained but acts as interpreter; she speaks three dialects of Chinese as well as Malay, and is a valuable assistant both in home visits and at the Clinics where the majority of persons dealt with and visited are unable to speak Malay.

Health Centres.—Two were started in May—one in Joo Chiat Road, Geylang, the other at Paya Lebar, Upper Serangoon Road, these parts being the most populated of the rural area. Clinics for Infants, children and mothers are held in each of these centres twice a week from 9 A.M. to 11 P.M.

Paya Lebar Centre.—Clinics are held in the Government Dispensary on Wednesdays and Saturdays. Mothers and children receive free treatment and any necessary drugs.

The aims of the Centres are primarily educational but many medical conditions and minor ailments have to be dealt with also.

The doctor in charge of the dispensary examines all new medical cases. Many attending the clinics come from homes previously visited, also any young children brought to the dispensary are requested to come next time on the children's days.

Children from all classes of society attend the centre, some arrive in private cars, taxicabs, omnibuses, others in rickshaws or even riding on their grannies' back. Our experience is that many children of well-to-do parents are the victims of errors of diet, unsuitable clothing and wrong management just as much as their poorer neighbours.

Nature of Teaching.—Advice is given on breast feeding, artificial feeding bottles, and utensils used in preparation of feeds.

On diet for older children, how to avoid worm infection, advice is also given on clothing, habits, care of teeth and hygiene generally.

Carious Teeth.—The majority of Chinese children examined suffer from carious teeth from their earliest years, the conditions appear to be specially marked when the child as an infant was artificially fed. The custom of Chinese people is to give infants milk at a very high temperature, which possibly has a destructive effect on the embryo teeth and may also account for the many cases of stomatitis among these infants. In a year or two these same children will be sucking ice balls which again will have a deleterious effect on young teeth. Too little hard food is another factor.

Antenatal Work.—Very few expectant mothers come to the clinic for advice.

WORK AT JOO CHIAT ROAD CLINIC

Clinics are held on Mondays and Saturdays at 9 A.M. to 11 A.M.

The work is the same as at Paya Lebar.

Home Visits.—This important part of the Welfare work is carried on as much as possible in co-operation with the travelling dispensary. Each day a sister follows the same route as the Travelling Dispensary, she calls at all Police Stations on the route to obtain all notifications of births for the past week. Each district is visited weekly.

Women and young children are more willing to come to the Travelling Dispensary for treatment if a sister is there.

Vaccination.—Very few infants over the age of nine months are found unvaccinated. Many severe cases of vaccinia have been met with and some serious abscesses on cases of cellulitis following after vaccination. These last conditions appear to be due to the vaccination sore as soon as it begins to suppurate being sealed over with some Chinese medicine which effectually prevents any drainage.

Whenever a new born infant is visited for the first time, other children in the house are if possible examined and the parents informed of the Children's Clinic Government Dispensaries or in the outlying districts the day and approximate hours when the Travelling Dispensary will be there. In this way each day new kampongs (villages) and isolated homes are brought in touch with medical assistance when they need.

Free Milk.—There have been very few cases where it has been necessary to provide free milk, errors of feeding being usually due to ignorance, or national habits rather than poverty. Artificial feeding, starchy foods such as flour, rice and potatoes being fed to a few days old infants. In Yeo Chu Kang Road, a rachitic infant of 5 months, weighing 7 lbs. was found to be sharing his fare from a clean long tube feeding bottle with a little sucking pig—there seemed nothing wrong with the pig.

The Nestle Swiss Milk Company have very generously given to the Centres a Baby Weighing Machine, a case of milk and two dozen feeding bottles, 2 dozen teats and valves.

MONTHLY PROGRESS REPORT FOR 31ST MAY TO DECEMBER 31ST, 1927.

CHILD WELFARE WORK—SINGAPORE RURAL AREA.

<i>Visits</i>		<i>1st Visits</i>	<i>Re-visits</i>	<i>Total</i>
Mothers, Ante-natal ...	...	24	8	32
Mothers, Post-natal ...	...	343	113	456
Infants ...	...	748	939	1,687
Pre-school children (examined) ...	...	2,087	122	2,209
Pre-school (treated) ...	...	241	109	350
Miscellaneous cases ...	...	56	—	56
Total ...	...	3,499	1,291	4,790

CLINIC AT JOO CHIAT ROAD.

Mothers, Ante-natal ...	...	6	—	6
Mothers, Post-natal ...	...	11	2	13
Infants ...	...	86	32	118
Pre-school children ...	...	284	101	385
Miscellaneous cases ...	...	56	—	56
Total ...	...	443	135	578

MONTHLY PROGRESS REPORT FOR 31ST MAY TO DECEMBER 31ST, 1927.

CHILD WELFARE WORK—SINGAPORE RURAL AREA.

<i>Visits</i>		<i>1st Visits</i>	<i>Re-visits</i>	<i>Total</i>
Mothers, Ante-natal ...	...	52	25	77
Mothers, Post-natal ...	...	671	224	895
Infants ...	...	1,342	2,253	3,595
Pre-school children (examined) ...	...	2,380	760	3,140
Pre-school (treated) ...	...	766	461	1,227
Miscellaneous cases ...	...	133	—	133
Total ...	...	5,344	3,723	9,067

CLINIC AT PAYA LEBAR.

Mothers, Ante-natal ...	...	10	6	16
Mothers, Post-natal ...	...	11	6	17
Infants ...	...	141	151	292
Pre-school children ...	...	371	259	630
Miscellaneous cases ...	...	—	—	—
Total ...	...	533	422	955

APPENDIX "Q"

RETURN OF YAWS AND SYPHILIS CASES TREATED IN THE BALIK PULAU DISTRICT,
PENANG, BY DR. A. G. H. SMART, M.B., Ch.B., D.P.H., *Acting Chief
Medical Officer.*

1. The total number of intravenous injections of N. A. B. given was 1,150—

In 1926	...	...	1,704 injections were given
In 1925	...	...	2,461 Do.
In 1924	...	...	1,522 Do.
In 1923	...	...	1,887 Do.

2. The number of visits paid was 76 of which 50 were at Balik Pulau and 26 at Bayan Lepas. The average number of injections given per visit was about 15 and the number of new cases treated during the year was 282 for Yaws and 223 for Syphilis.

3.—(a) The number of 1st injections for Yaws	282	} 655
„ 2nd	„	...	240	
„ 3rd	„	...	86	
„ 4th	„	...	29	
„ 5th	„	...	13	
„ 6th	„	...	4	
„ 7th	„	...	1	

(b) The number of 1st injections for Syphilis	223	} 495
„ 2nd	„	...	148	
„ 3rd	„	...	75	
„ 4th	„	...	28	
„ 5th	„	...	15	
„ 6th	„	...	6	

4.—(a) The number of injections for Primary Yaws	...	377	} 655
„ Secondary „	...	198	
„ Tertiary „	...	80	

(b) The number of injections for Primary Syphilis	...	2	} 505
„ Secondary „	...	493	
„ Tertiary „	...	10	

5. *Nationality*—

		<i>Males</i>	<i>Females</i>	<i>Total</i>
		—	—	—
(a) <i>Yaws</i> .—Malays	...	257	306	563
Chinese	...	39	37	76
Tamil	...	10	6	16
				655
(b) <i>Syphilis</i> .—Malays	...	29	4	33
Chinese	...	364	25	389
Tamil	...	65	8	73
				495

6. *Drugs employed*.—The equivalents of 359½ tubes of .09 gram of neosalvarsan.

7. *Notes*—

(a) The treatment of Yaws and Syphilis by N. A. B. injections continued to be popular among all classes of people as during the previous years.

(b) None developed any systems of poisoning after the injections during the year.

TABLE I.

STAFF

1. The sanctioned European staff in the Straits Settlements numbers 131, distributed as follows :—

GENERAL

Principal Civil Medical Officer, Straits Settlements.
One Financial Officer, Medical Department.

HOSPITALS AND DISPENSARIES

Chief Medical Officer, Singapore.
One Financial Officer, Hospitals, Singapore.
Chief Medical Officer, Penang.
Chief Medical Officer, Malacca.
Senior Surgeon, Singapore.
One Radiologist, Singapore.
Surgeon, Penang.
Nine Medical Officers, Singapore. (Two ladies).
Seven Medical Officers, Penang. (One lady).
One Medical Officer, Malacca.
One Dispensing Chemist, Singapore.
One Medical Officer, Labuan.
Five Supernumerary Medical Officers, Singapore.
One Matron, Superscale, General Hospital, Singapore.
One Matron, Class I, Penang.
Six Matrons, Class II.
Thirty-one sisters, Singapore.
Eleven sisters, Penang.
One sister, Malacca.
Two European Attendants.
One Lady Superintendent, Leper Asylum, Pulau Jerejak.

HEALTH BRANCH

Chief Health Officer, Singapore.
Senior Health Officer, Penang.
Three Health Officers, Singapore. (One lady).
One Health Officer, Malacca.
Three Sanitary Inspectors. (Two chiefs).
Lady Superintendent, Quarantine Station, Singapore.
Three Public Health Sisters.
Lay Superintendent, Quarantine Station, Penang.
One Sister, Quarantine Station, Singapore.

PATHOLOGICAL BRANCH

One Pathologist, Singapore.
One Pathologist, Penang.
One Bacteriologist, Singapore.

COLLEGE OF MEDICINE, SINGAPORE.

Principal.
Professor of Physiology.
Professor of Anatomy.
Professor of Medicine.
Professor of Surgery.
Professor of Clinical Surgery.
Professor of Midwifery and Gynæcology.
Professor of Bacteriology.
Professor of Biology.
Professor of Bio-Chemistry.
Professor of Dental Surgery.
Dental Mechanic.
Janitor.

LUNATIC ASYLUM, SINGAPORE

Medical Superintendent.
One Matron, Class II.
Three European Attendants.

SOCIAL HYGIENE BRANCH, SINGAPORE

Chief Medical Officer.
One Medical Officer.

ANALYST'S BRANCH

Analyst, Singapore.
Deputy Analyst, Penang.
Four Assistant Analysts, Singapore.

2. In addition fourteen time-scale Medical or Health Officers and seven nursing sisters are borne one the establishment for service in the Unfederated Malay States, and one time-scale Medical Officer for service at the Indian Immigration Depôt, Avadi, Madras, making a total of 153.

The post of Principal Medical Officer, Johore, is also held by a member of the Straits Medical Department.

3. The local qualified medical staff (Specialists, Deputy Medical Officers, Deputy Health Officers, Assistant Medical Officers, Assistant Health Officers and Assistant Surgeons) numbered 68.

TABLE II

FINANCIAL

1927

Revenue

				\$	c.	\$	c.
<i>Singapore—</i>							
Hospitals Board	..	...	...	297,285	53		
Medical General	...	...	...	5,085	00		
Health	...	..	...	54,337	20		
Analyst	...	..	...	15,085	00		
						371,792	73
<i>Penang—</i>							
Hospitals Board	...	...	...	85,669	39		
A Payment for lepers	..	...	...	83,639	49		
Medical General	}	..	...	36,804	79		
B Health							
Analyst							
						206,113	67
<i>Malacca—</i>							
Hospitals Board	...	...	...	21,543	40		
Medical General	}	...	...	2,272	50		
Health							
						23,815	90
<i>Labuan—</i>							
...	..	...	...	1,976	60		
						1,976	60
Total				...		\$603,698	90

I. The revenue collected in the Medical Department is classified under three headings, *viz.* :—

(a) Hospitals Board (Hospitals and Dispensaries).

(b) Medical General which includes Medical, Pathological Branch, College of Medicine, Singapore, Lunatic Asylum and Government Analyst's Branch.

(c) Health Branch.

The income from "Hospitals and Dispensaries" and Lunatic Asylum, Singapore, is paid into the account of the Hospitals Board, which is administered by a Special Committee. In addition to the amounts paid into the Hospitals Board Account as shown above the Board received contributions from Government for the various Settlements as follows:—

					\$
Singapore	...	...	...	...	782,020
Penang	...	...	...	...	435,570
Malacca	...	...	...	...	85,380
Labuan	...	...	...	...	3,460
Total ...					<u>\$1,306,430</u>

3. No income is derived from the Pathological Branch.

4. Fees collected under Medical General and Health Branch are paid into the Treasury as General Government Revenue.

5. Fees collected under College of Medicine, Singapore, are paid into the College Fund.

1927

Expenditure

			\$	c.	\$	c.
<i>Singapore—</i>						
Hospitals Board	...	...			752,731	12
Medical General—						
Medical Personal Emoluments	...	...	37,297	68		
„ Other Charges	...	...	37,241	86		
Pathological Branch, Personal Emoluments			16,027	65		
„ „ Other Charges	...	...	5,744	48		
College of Medicine, Personal Emoluments			153,379	12		
„ „ Other Charges	...	...	19,183	47		
Lunatic Asylum, Personal Emoluments	...	...	51,469	47		
Analyst's Branch, Personal Emoluments	...	...	31,623	01		
„ „ Other Charges	...	...	1,967	16		
Health Branch, Personal Emoluments	...	...	212,666	53		
„ „ Other Charges	...	...	183,860	21		
Hospitals and Dispensaries Personal Emoluments	...	...	887,718	90		
Hospitals and Dispensaries, Other Charges			6,767	04		
Social Hygiene Branch, Personal Emoluments	...	...	38,273	86		
Social Hygiene Branch, Other Charges	...	...	41,910	01		
Medical Proper, General Clerical Service, Personal Emoluments	...	...	25,842	79		
Health Branch, Personal Emoluments	...	...	4,790	66		
Social Hygiene Branch, Personal Emoluments	...	...	2,431	61		
					<u>1,758,195</u>	<u>51</u>
Total ...					<u>\$2,510,926</u>	<u>63</u>

	\$	c.	\$	c.
<i>Penang—</i>				
Hospitals Board			435,902	41
Medical General including Pathological Branch, Personal Emoluments ...	22,037	92		
Medical including Pathological Branch, Other Charges	5,585	00		
Analyst's Branch, Personal Emoluments ...	10,680	00		
„ „ Other Charges ...	920	53		
Health Branch, Personal Emoluments ...	65,167	14		
„ „ Other Charges ...	141,605	59		
Social Hygiene Branch, Personal Emolu- ments	1,788	00		
Social Hygiene Branch, Other Charges ...	9,227	15		
Hospital and Dispensaries, Personal Emo- luments	289,125	57		
Federated Malay States Agency ...	1,774	60		
General Clerical Service, Personal Emolu- ments	16,582	68		
			564,494	18
Total ...			\$1,000,396	59
	\$	c.	\$	c.
<i>Malacca—</i>				
Hospitals Board			109,514	97
Medical, Personal Emoluments ...	15,992	44		
Medical, Other Charges	1,715	00		
Pathological Branch, Personal Emoluments	6,145	60		
„ „ Other Charges ...	2,038	10		
Health Branch, Personal Emoluments ...	18,952	60		
„ „ Other Charges ...	54,684	37		
Hospitals and Dispensaries	87,461	36		
Social Hygiene Branch, Personal Emolu- ments	1,251	00		
Social Hygiene Branch, Other Charges ...	2,952	80		
			191,193	27
Total ...			\$300,708	24
	\$	c.	\$	c.
<i>Labuan—</i>				
... ..			18,460	18

SUMMARY

	\$	c.
Singapore	2,510,926	63
Penang	1,000,396	59
Malacca	300,708	24
Labuan	18,460	18

Grand Total ... \$3,830,491 64

The Other Charges of the Hospitals and Dispensaries are shown under the Head Hospitals Board Expenditure.

1. The total expenditure of the Medical Department for the Straits Settlements for the year 1927 amounted to \$3,830,491.64.

2. Under College of Medicine, expenditure for Personal Emoluments is shown as \$153,379.12 and Other Charges as \$19,183.47. Half of these amounts were refunded by the Federated Malay States Government.

TABLE III A

ESTIMATED POPULATION, WITH BIRTH AND DEATH-RATES FOR THE YEARS 1926 AND 1927

Settlement or Province	Population		Births		Deaths		Birth-ratio per mille		Death-ratio per mille	
	Estimated, 1926	Estimated, 1927	1926		1926		1926		1926	
			1927		1927		1927		1927	
Singapore	...	...	...	...	...	...	...	...	...	...
Labuan	...	...	...	...	...	...	...	...	...	...
Penang	...	...	...	...	...	...	...	...	...	...
Province Wellesley	...	...	...	...	...	...	...	...	...	...
Dindings	...	...	...	...	...	...	...	...	...	...
Malacca	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...
	491,538	532,296	15,798	17,464	16,045	17,383	30.98	32.81	31.37	32.66
	5,694	5,781	303	264	210	204	53.71	45.67	37.21	34.02
	173,217	181,104	5,923	6,860	6,046	6,523	33.63	37.88	34.23	36.02
	131,577	135,028	4,557	4,734	4,250	4,303	34.54	35.06	32.21	31.87
	15,185	16,931	473	508	476	566	29.09	30.00	29.27	33.43
	177,010	188,828	6,640	7 403	5,606	6,582	36.00	39.30	30.40	34.86
	994,266	1,059,968	33,694	37,233	32,633	35,561	32.85	35.13	31.81	33.55

TABLE III B

QUARTERLY DEATH-RATES FOR VARIOUS PARTS OF THE COLONY DURING THE PAST 3 YEARS WERE:—

Year	1925				1926				1927			
	1925				1926				1927			
Quarter	Ist	2nd	3rd	4th	Ist	2nd	3rd	4th	Ist	2nd	3rd	4th
Singapore	...	...	...	...	...	...	...	...	...	...	...	...
Penang Island	...	...	...	...	...	...	...	...	...	...	...	...
Province Wellesley	...	...	...	...	...	...	...	...	...	...	...	...
Dindings	...	...	...	...	...	...	...	...	...	...	...	...
Malacca	...	...	...	...	...	...	...	...	...	...	...	...
	22.91	28.32	28.26	30.85	26.42	36.01	32.60	30.41	28.42	34.07	35.67	32.39
	28.80	30.91	29.97	31.51	33.93	41.42	32.81	29.23	33.72	37.78	36.19	36.34
	25.31	27.93	29.20	31.15	27.88	36.51	32.09	32.33	29.91	31.99	32.79	32.72
	18.14	26.23	26.23	22.73	26.39	28.13	30.76	31.49	27.53	28.20	38.43	39.27
	22.25	22.07	21.76	23.44	29.17	33.18	29.69	29.54	35.06	36.16	35.40	32.81

TABLE III C

POPULATION ESTIMATED RACIALLY AND COLLECTIVELY OF THE STRAITS SETTLEMENTS FOR THE YEARS 1927, 1926 AND 1925

Settlement or Province	1927 Europeans	1927 Eurasians	1927 Chinese	1927 Malays	1927 Indians	Other Nation- alities 1927	Total		
							1927	1926	1925
Singapore	8,825	6,358	404,856	64,511	39,587	8,159	532,296	511,441	491,583
Penang	1,355	1,640	114,814	37,439	23,986	1,870	181,104	176,126	173,217
Province Wellesley	454	375	35,587	67,507	30,636	469	135,028	131,930	131,577
Dindings	28	30	3,917	5,523	7,413	20	16,931	16,260	15,185
Malacca	619	1,968	54,410	91,537	40,058	236	188,828	184,437	177,010
Labuan	24	14	1,565	4,035	97	46	5,781	5,641	5,694
Total	11,305	10,385	615,149	270,552	141,777	10,800	1,059,968	1,025,835	994,266

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TABLE III D

BIRTHS REGISTERED IN THE STRAITS SETTLEMENTS DURING 1927 AND THEIR RATIO PER MILLE OF POPULATION

Settlement or Province	Male	Female	Total, 1927	Total, 1926	Total, 1925	Ratio per mille	
						1927	1925
Singapore	9,186	8,278	17,464	15,798	15,044	32.81	30.87
Penang	3,466	3,394	6,860	5,923	5,783	37.88	33.39
Province Wellesley	2,453	2,281	4,734	4,557	4,374	35.06	33.24
Dindings	202	246	508	473	433	30.00	28.51
Malacca	3,734	3,669	7,403	6,640	5,798	39.20	32.76
Labuan	138	126	264	303	233	44.02	40.92
Total	19,239	17,994	37,233	33,694	31,665	35.13	31.98

TABLE III E
BIRTHS REGISTERED IN THE STRAITS SETTLEMENTS DURING 1927 ACCORDING TO NATIONALITIES

Settlement or Province	Europeans		Eurasians		Chinese		Malays		Indians		Japanese		Other Nationalities & Unknown		Total	
	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio
Singapore ...	141	15.98	177	27.84	13,432	33.18	2,664	41.30	773 S. 144 N.	23.16	94	...	39	4.78	17,464	32.81
Penang ...	72	53.14	57	34.76	4,456	38.82	1,441	38.49	724 S. 31 N.	31.47	3	...	76	40.64	6,860	37.88
Province Wellesley ...	1	2.20	6	16.00	1,457	40.94	2,453	36.33	809 S. 2 N.	26.47	...	...	6	12.79	4,734	35.06
Dindings ...	...	...	...	...	142	36.25	255	46.17	111	14.99	...	...	...	...	508	30.00
Malacca ...	4	6.46	70	35.57	2,128	39.11	4,657	50.88	525 S. 11 N.	13.39	1	..	7	29.66	7,403	39.30
Labuan ...	1	41.67	4	285.71	83	53.03	172	42.63	1	10.31	...	...	3	65.22	264	45.67
Total ...	219	19.37	314	30.24	21,698	35.27	11,642	43.03	3,131	22.08	98	...	131	12.13	37,233	35.13

S.—denotes Southern. N.—denotes Northern.

TABLE III F
DEATHS REGISTERED IN THE STRAITS SETTLEMENTS IN 1927 ACCORDING TO NATIONALITIES

Settlement or Province	Europeans		Eurasians		Chinese		Malays		Indians		Other Nationalities and Unknown		Total	
	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille	No.	Ratio p. mille
Singapore ...	67	7.59	119	18.72	13,280	32.80	2,598	40.27	1,181	29.83	138	16.93	17,383	32.66
Penang ...	27	19.93	36	21.95	3,821	33.28	1,377	36.77	1,200	50.03	62	33.16	6,523	36.02
Province Wellesley ...	...	...	2	5.36	1,234	34.68	1,976	29.27	1,072	34.99	19	40.51	4,303	31.87
Dindings ...	...	...	...	...	188	48.00	192	34.76	183	24.69	3	150.00	566	33.43
Malacca ...	4	6.46	40	20.33	1,946	35.77	3,633	39.69	954	23.82	5	21.19	6,582	34.86
Labuan ...	...	...	...	...	45	23.73	147	41.06	4	9.04	8	571.42	204	35.29
Total ...	98	8.67	197	18.96	20,514	33.34	9,923	36.68	4,594	32.40	235	21.75	35,561	33.55

TABLE III G
DEATHS REGISTERED IN THE STRAITS SETTLEMENTS IN 1927 UNDER DIFFERENT GROUPS OF AGES

AGES		Singapore	Penang	Province Wellesley	Dindings	Malacca	Labuan	Total
Under 3 months	...	2,147	698	529	58	1,473	23	4,928
3 months and under 1 year	...	1,898	536	203	34	686	33	3,390
1 year to 5 years	...	1,529	655	624	94	490	17	3,409
5 years to 10 "	...	503	200	187	30	197	4	1,121
10 " 20 "	...	692	287	231	36	234	5	1,485
20 " 25 "	...	1,121	320	233	36	301	7	2,018
25 " 35 "	...	2,783	859	568	96	942	10	5,258
35 " 45 "	...	2,480	932	469	74	241	18	4,814
45 " 55 "	...	1,916	769	366	43	535	16	3,645
55 " 75 "	...	1,816	959	630	50	673	71	4,199
75 " and above	...	423	233	257	12	208	...	1,133
Total	...	17,383	6,523	4,303	566	6,582	204	35,561

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TABLE III H
TABLE SHOWING THE INFANTILE MORTALITY (UNDER ONE YEAR) IN THE STRAITS SETTLEMENTS INCLUDING CHILDREN BORN ELSEWHERE

Settlements		Births	Deaths	Ratio per mille of Births	
				1927	1925
Singapore	...	17,464	4,069	232.99	227.94
Penang	...	6,860	1,234	179.88	178.29
Province Wellesley	...	4,734	732	154.63	136.93
Dindings	...	508	92	181.10	205.07
Malacca	...	7,403	2,159	291.64	268.22
Labuan	...	264	56	212.12	257.42
Total	...	37,233	8,342	224.04	214.79
					194.00

TABLE III I

TABLES SHOWING THE INFANTILE MORTALITY (CHILDREN UNDER ONE YEAR) IN THE STRAITS SETTLEMENTS AND NATIONALITIES.
EXCLUDING CHILDREN BORN ELSEWHERE

NATIONALITIES	SINGAPORE			PENANG			PROVINCE WELLESLEY			DINDINGS			MALACCA			LABUAN			TOTAL		
	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Ratio
Europeans	3	1	21.28	1	...	13.89	...	...	...	...	...	...	...	...	...	...	...	...	4	1	18.27
Eurasians	24	...	135.59	3	...	50.84	...	...	...	...	...	...	...	...	...	...	...	...	40	...	127.39
Chinese	2,764	140	206.15	720	58	161.58	5	125.60	183	1	133.80	11	184.68	10	120.48	4,089	...	215	4,089	...	188.45
Malays	857	72	321.70	285	12	196.26	9	138.19	339	2	141.10	12	336.70	46	267.49	3,132	...	107	3,132	...	269.03
Northern Indians	27	1	187.50	3	1	172.18	8	200.99	160	2	270.27	1	90.91	...	...	221	...	12	208.24	...	...
Southern Indians	146	6	188.87	127	20	46.15	...	366.66	3	...	...	...	7	295.24	...	431	...	33	...	...	30.61
Japanese	2	...	21.28	1	...	...	2	...	...	...	...	...	...	...	...	3	...	...	3	...	381.68
Other Nationalities and Unknown	26	...	66.67	2	1	...	...	...	22	1	...	...	...	...	...	50	...	...	50	...	...
Total	3,849	220	220.40	1,140	92	166.47	24	161.87	708	6	169.29	30	287.59	56	212.12	7,970	...	...	372	...	214.06

TABLE III J

DEATHS REGISTERED IN THE STRAITS SETTLEMENTS AS REGARDS CERTIFICATES IN THE YEAR 1927

Particulars	Singapore			Penang		Province Wellesley		Dindings		Malacca		Labuan		Total
	Deaths	No. born elsewhere	Ratio	Deaths	No. born elsewhere	Deaths	No. born elsewhere	Deaths	No. born elsewhere	Deaths	No. born elsewhere	Deaths	No. born elsewhere	
Died in Hospitals	20	...	7,495
Certified by Medical Practitioners	18	...	5,261
Certified by Registering Officers after death	38	...	8,974
Uncertified	128	...	13,831
Total	6,523	...	4,303	...	566	...	6,582	...	204	...	35,561

TABLE IV

Meteorological Returns for the Straits Settlements for the year 1927 and also two graphs supplied by Dr. GILBERT E. BROOKE, showing the wettest and driest years since 1869, and the annual rainfall in inches and millimetres since 1862.

METEOROLOGICAL RETURN FOR THE YEAR 1927

Singapore

		TEMPERATURE						RAINFALL		WINDS		REMARKS
		Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in m. m.	Degree of Humidity	General Direction	Average Force	
January	...	148	70.8	85.2	73.1	12.1	78.0	337.85	84	N.	1.8	
February	...	151.1	70.7	85.0	73.7	12.2	78.7	129.90	82	N.E.	2.1	
March	...	154.6	72.2	88.4	74.8	12.6	80.3	207.22	82	N.E.	1.9	
April	...	144.9	72.3	87.5	74.7	12.8	80.2	274.05	84	S.W.	1.3	
May	...	145.2	72.	88.5	74.9	13.6	80.4	237.01	82	S.W.	1.4	
June	...	144.8	73.1	88.1	75.1	13.	80.5	138.29	79	S.E.	1.6	
July	...	145.3	73.1	88.5	74.9	13.6	80.7	77.20	79	S.E.	1.7	
August	...	149.7	73.1	88.5	74.8	13.7	80.4	165.32	79	S.E.	1.9	
September	...	151.6	72.3	87.6	74.6	13.	79.9	159.10	82	S.E.	1.6	
October	...	144.0	71.8	86.8	73.7	13.1	79.1	220.04	83	S.W.	1.3	
November	...	137.5	72.3	86.3	73.9	12.4	78.9	232.07	85	N.E.	1.5	
December	...	139.7	71.9	86.3	73.8	12.5	78.9	298.38	84	N.E.	1.7	
Mean	...	146.4	721.	87.3	74.3	13.0	79.6	2,576.43	82		1.65	

METEOROLOGICAL RETURN FOR THE YEAR 1927

Penang

		TEMPERATURE						RAINFALL		WINDS		REMARKS
		Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in m.m.	Degree of Humidity	General Direction	Average Force	
January	...	158	69	98	69	29	81.8	92	73	E.&N.W.	...	
February	...	168	67	95	70	25	82.8	102	67	N.	...	
March	...	161	69	96	71	25	82.8	214	83	E.	...	
April	...	160	70	95	70.5	24.5	82.9	312	81	E.	...	
May	...	161	70	94	70	24	82.3	175	84	N.W.	...	
June	...	163	70	93	71	22	82.1	137	87	S.	...	
July	...	163	70	94	71	23	82.3	86	83	S.	...	
August	...	160	70	94	71	23	82.2	208	89	E.	...	
September	...	160	69	94	71	23	81.8	310	91	S.	...	
October	...	165	69	93	69	24	81.3	243	81	N.W.	...	
November	...	164	70	93	70.5	22.5	82.2	284	84	N.W.	...	
December	...	168	69	94.5	70	24.5	82.6	113	80	N.W.	...	
Means or Extremes	...	168	69	98	69	29	82.3	2,276	81		...	

METEOROLOGICAL RETURN FOR THE YEAR 1927

Malacca

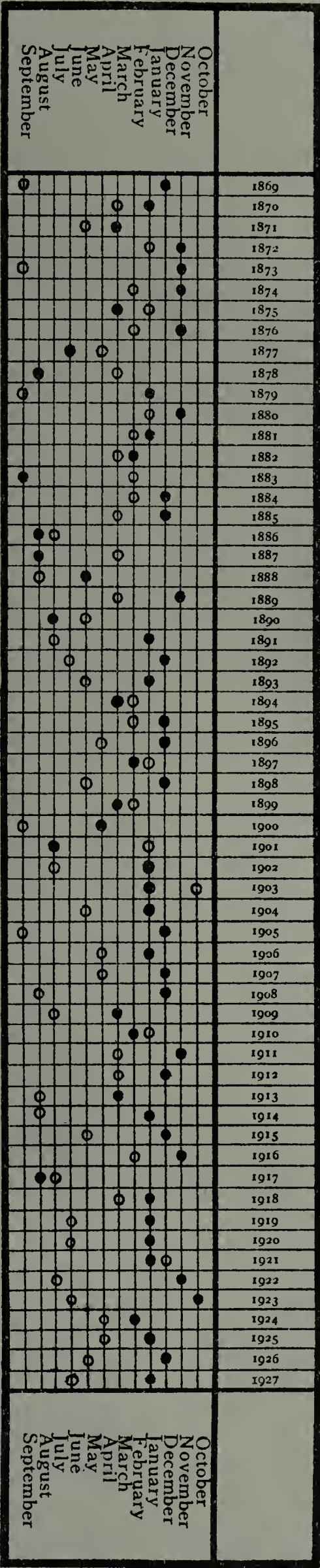
		TEMPERATURE					RAINFALL		WINDS	REMARKS
		Solar Maximum	Shade Maximum	Shade Minimum	Range	Mean	Amount in m.m.	Degree of Humidity	General Direction	
January	...	113	87	73	14	78	216.3	86	N.E.	
February	...	123	88	74	14	78	31.5	83	N.E.	
March	...	122	89	74	15	80	209.0	87	N.E.	
April	...	115	88	74	14	79	314.6	88	N.E.	
May	...	111	89	74	15	80	175.2	88	N.E.	
June	...	115	89	74	15	80	126.1	88	N.E.	
July	...	122	89	74	15	80	197.0	88	N.E.	
August	...	122	88	74	14	79	331.4	89	N.E.	
September	...	111	88	74	14	79	167.8	89	N.E.	
October	...	117	89	75	14	80	387.5	89	N.E.	
November	...	117	89	74	15	80	258.8	89	N.E.	
December	...	115	88	74	14	80	208.6	89	N.E.	
Mean		116	88	74	...	79	2,623.8	87		

METEOROLOGICAL RETURN FOR THE YEAR 1927

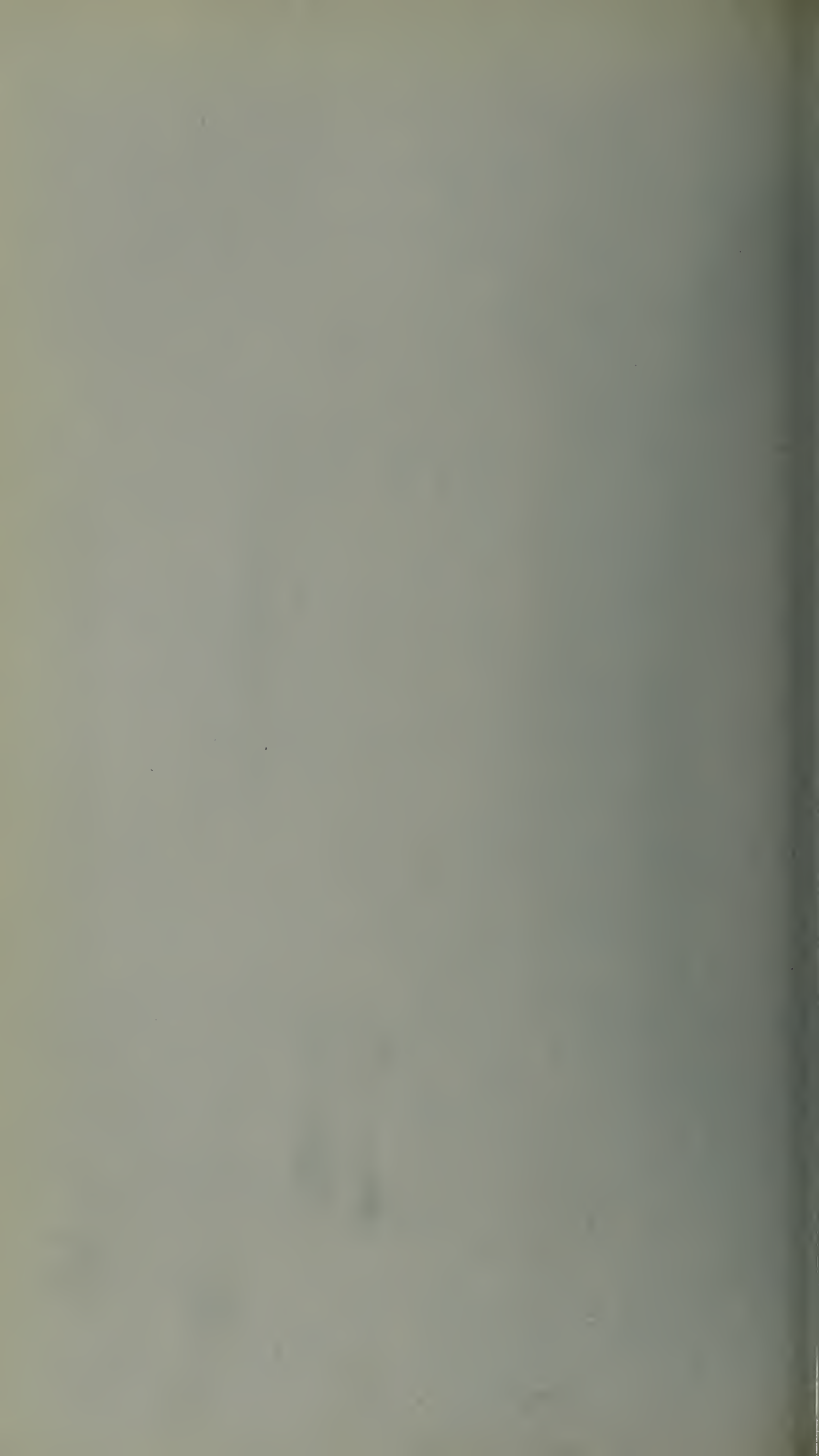
Labuan

		TEMPERATURE					RAINFALL		WINDS		REMARKS
		Solar Maximum	Shade Maximum	Shade Minimum	Range	Mean	Amount in m.m.	Degree of Humidity	General Direction	Average Force	
January	...	131	87.8	77.6	10.2	82.7	189.5	84	C. N. E.	2	
February	...	131	86.8	77.4	9.4	82.1	183.0	87	C. N. E.	2	
March	...	141	88.4	77.7	10.7	83.0	83.0	84	C. N. E.	2	
April	...	146	89.9	81.0	8.9	85.4	414.5	82	C.N.E., S.O.	1	
May	...	141	88.8	74.9	13.9	83.1	327.5	84	C. S. W.	1	
June	...	144	89.1	77.7	11.4	83.4	492.0	82	"	1	
July	...	145	88.9	77.7	11.7	83.0	145.5	82	"	1	
August	...	136	88.9	77.8	11.1	83.3	72.0	81	"	1	
September	...	136	88.3	77.1	11.2	82.7	620.5	84	C.S.W., N.E.	1	
October	...	134	87.9	77.0	10.9	82.4	290.0	83	C. S. W.	1	
November	...	135	87.7	76.5	11.2	82.1	371.5	84	"	1	
December	...	135	87.6	76.8	10.8	82.2	392.5	84	"	1	
Mean	...	137	88.3	77.3	10.9	82.9	3,581.5	83	...	1.25	

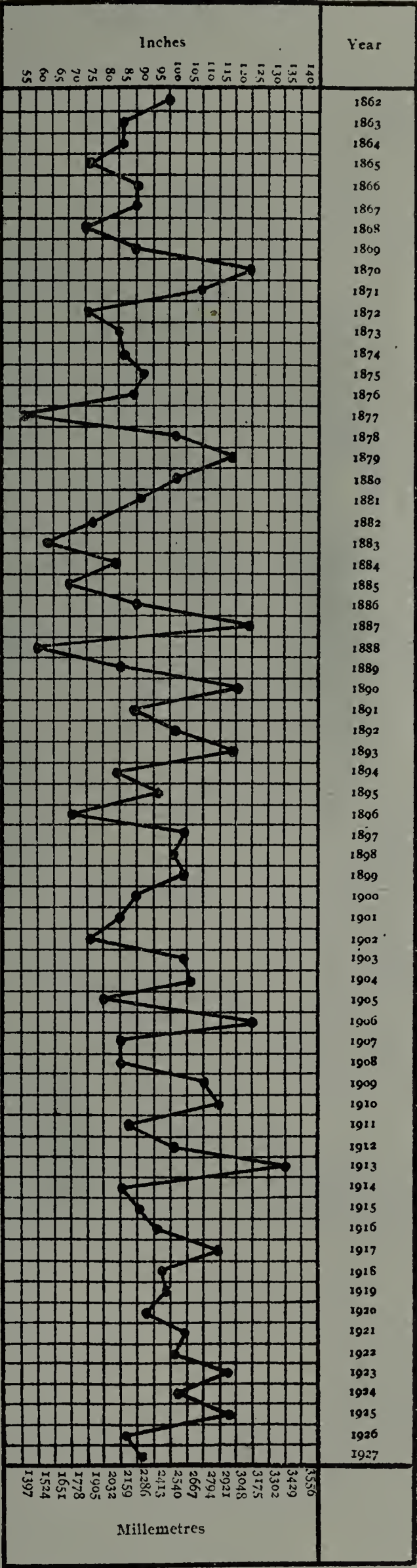
SHOWING THE WETTEST AND DRIEST MONTHS DURING THE SAME YEARS



- Wettest months during the years
- Driest months during the years



ANNUAL RAINFALL



SHOWING THE ANNUAL RAINFALL IN INCHES AND MILLEMETRES SINCE 1862

TABLE V
HOSPITALS OR INSTITUTIONS STRAITS SETTLEMENTS

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927

DISEASES	*Remaining in Hospital at the end of 1926	YEARLY TOTAL		† Total Cases Treated	‡ Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
1.—EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES						
1. Enteric Group—						
(a) Typhoid Fever ...	15	267	130	282	18	
(b) Paratyphoid A. ...	...	3	...	3	...	
(c) Paratyphoid B. ...	...	10	1	10	5	
(d) Type not defined	..	...	..	...	...
2. Typhus ...	1	1	...	2	...	
3. Relapsing Fever ...	...	...	...	...	...
4. Undulant Fever ...	...	...	...	...	...
5. Malaria—						
(a) Tertian ...	70	3,457	107	3,527	90	
(b) Quartan ...	11	258	15	269	3	
(c) Aestivo-autumnal	149	6,380	660	6,529	185	
(d) Cachexia ...	42	1,075	74	1,117	51	
(e) Blackwater ...	...	8	1	8	...	
(f) Mixed infection ...	8	476	17	484	12	
(g) Unclassified ...	61	3,372	69	3,433	95	
6. Small-pox ...	2	48	5	50	1	
7. Measles ...	4	66	1	70	6	
8. Scarlet Fever ...	...	...	...	...	...
9. Whooping Cough ...	...	5	...	5	..	
10. Diphtheria ...	...	9	3	9	...	
11. Influenza ...	20	1,284	56	1,304	12	
12. Miliary Fever ...	...	...	...	...	...
13. Mumps ...	...	27	...	27	...	
14. Cholera ...	1	51	13	52	..	
15. Epidemic diarrhoea ...	..	...	...	..	...
16. Dysentery—						
(a) Amœbic ...	46	977	308	1,023	42	
(b) Bacillary ...	44	527	240	571	14	
(c) Undefined or due to other causes	9	235	40	244	4	
Carried forward ...	483	18,536	1,740	19,019	538	

The form shows in the main the arrangement of diseases in the *International Nomenclature, 1921 Edition*. To save space the unimportant diseases of any class can be grouped in their places as "Other Diseases" of the Class

* *i.e.* the year previous to that for which the return is made

† "Total cases treated" will, of course include those remaining in Hospital at the end of the previous year.

The figures in this column to be carried on to the next year's Return.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total Cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	483	18,536	1,740	19,019	538	
I.—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES.— (Continued)						
17. Plague—						
(a) Bubonic ...	...	2	1	2	...	
(b) Pneumonic ...	...	...	...	...	...
(c) Septicæmic ...	...	...	...	...	...
(d) Undefined ...	...	...	...	...	...
18. Yellow Fever ...	...	...	...	...	...
19. Spirochætosis ictero- hæmorrhagica ...	...	1	1	1	...	
20. Leprosy ...	837	385	151	1,222	864	
21. Erysipelas ...	2	17	2	19	...	
22. Acute Poliomyelitis ...	...	1	...	1	...	
23. Encephalitis Lethargica ...	...	3	1	3	...	
24. Epidemic Cerebro- spinal Fever ...	...	13	2	13	...	
25. Other Epidemic Diseases—						
(a) Rubella (German Measles) ...	...	1	...	1	...	
(b) Varicella (Chic- ken pox) ...	3	64	...	67	2	
(c) Kala-azar ...	...	1	...	1	...	
(d) Phlebotomus Fever ...	...	...	...	...	...
(e) Dengue ...	...	142	...	142	3	
(f) Epidemic Dropsy ...	...	...	...	...	...
(g) Yaws ...	1	23	...	24	3	
(h) Trypanosomiasis ...	...	...	...	...	...
26. Glanders ...	...	...	...	...	...
27. Anthrax ...	...	...	...	...	...
28. Rabies ...	...	1	...	1	...	
29. Tetanus ...	3	50	31	53	2	
30. Mycosis ...	...	...	...	...	...
31. Tuberculosis, Pulmo- nary and Laryngeal ...	133	1,778	917	1,911	152	
32. Tuberculosis of the Me- ninges or Central Ner- vous System ...	...	20	16	20	1	
33. Tuberculosis of the In- testines or Peritoneum ...	1	47	40	48	1	
34. Tuberculosis of the Vertebral Column ...	2	7	3	9	3	
<i>Carried forward</i> ...	1,465	21,092	2,905	22,557	1,569	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward ...</i>	1,465	21,092	2,905	22,557	1,569	
I.—EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES.— (Continued)						
35. Tuberculosis of Bones and Joints ...	15	64	3	79	17	
36. Tuberculosis of other organs—						
(a) Skin or Subcuta- neous Tissue (Lu- pus) ...	...	...	...	...	...
(b) Bones ...	...	...	...	...	...
(c) Lymphatic System	1	23	1	24	2	
(d) Genito-urinary ...	1	9	3	10	...	
(e) Other organs ...	1	31	1	32	4	
37. Tuberculosis dissemina- ted—						
(a) Acute ...	...	2	2	2	...	
(b) Chronic ...	...	...	...	...	...
38. Syphilis—						
(a) Primary ...	47	686	...	733	42	
(b) Secondary ...	151	1,468	22	1,619	142	
(c) Tertiary ...	59	662	45	721	79	
(d) Hereditary ...	...	10	6	10	...	
(e) Period not indica- ted ...	1	13	11	14	1	
39. Soft Chancre ...	37	585	...	622	44	
40. A.—Gonorrhœa and its complications ...	42	786	1	828	61	
B.—Gonorrhœal Oph- thalmia ...	17	67	1	84	6	
C.—Gonorrhœal Arthri- tis ...	14	166	...	180	25	
D.—Granuloma Vene- reum ...	...	9	...	9	1	
41. Septicæmia ...	2	75	65	77	2	
42. Other Infectious Disea- ses ...	1	20	6	21	3	
II.—GENERAL DISEASES NOT MENTIONED ABOVE						
43. Cancer or other mali- gnant Tumours of the Buccal Cavity ...	3	26	18	29	...	
44. Cancer or other mali- gnant Tumours of the Stomach or Liver ...	3	84	57	87	3	
<i>Carried forward ...</i>	1,860	25,878	3,147	27,738	2,001	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total Cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	1,860	25,878	3,147	27,738	2,001	
II.—GENERAL DISEASES NOT MENTIONED ABOVE.— (Continued)						
45. Cancer or other malignant Tumours of the Peritoneum, Intestines, Rectum ...	3	19	5	22	1	
46. Cancer or other malignant Tumours of the Female Genital Organs ...	1	24	6	25	2	
47. Cancer or other malignant Tumours of the Breast ...	2	5	3	7	1	
48. Cancer or other malignant Tumours of the Skin ...	2	36	5	38	3	
49. Cancer or other malignant Tumours of Organs not Specified ...	2	61	15	63	5	
50. Tumours non-malignant ...	5	77	2	82	4	
51. Acute Rheumatism ...	2	63	..	65	1	
52. Chronic Rheumatism ...	3	74	...	77	5	
53. Scurvy (including Barlow's Disease) ...	...	...	...	...	...
54. Pellagra ...	...	1	...	1	...	
55. Beri-beri ...	118	1,620	358	1,738	166	
56. Rickets ...	..	4	...	4	...	
57. Diabetes (not including Insipidus) ...	2	11	...	13	...	
58. Anæmia— ...						
(a) Pernicious ...	1	17	3	18	...	
(b) Other Anæmias and Chlorosis ...	3	62	5	65	3	
59. Diseases of the Pituitary Body ...	...	...	...	...	...
60. Diseases of the Thyroid Gland—						
(a) Exophthalmic Goitre ...	...	...	...	...	...
(b) Other diseases of the Thyroid Gland. Myxœdema ...	...	1	1	1	...	
61. Diseases of the Parathyroid Glands ...	...	...	...	...	...
62. Diseases of the Thymus ...	...	...	...	...	...
63. Diseases of the Suprarenal Glands ...	...	...	...	...	...
64. Diseases of the Spleen ...	...	21	4	21	...	
<i>Carried forward</i> ...	2,004	27,974	3,554	29,978	2,192	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	2,004	27,974	3,554	29,978	2,192	
II.—GENERAL DISEASES NOT MENTIONED ABOVE.— (Continued)						
65. Leukæmia—						
(a) Leukæmia ...	...	7	2	7	...	
(b) Hodgkin's Dis- ease ...	...	I	...	I	...	
66. Alcoholism ...	2	III	...	II3	2	
67. Chronic poisoning by mineral substances (lead, mercury, etc.)	...	...	...	...	...
68. Chronic poisoning by organic substances (Morphia, Cocaine, etc.) ...	8	514	...	522	16	
Opium Habit ...	14	929	...	943	8	
69. Other General Disea- ses—	6	II	I	17	I	
Auto-intoxication ...	...	6	I	6	...	
Purpura Hæmorrh- gica ...	...	...	...	...	...
Hæmophilia ...	...	I	...	I	...	
Diabetes Insipidus ...	...	12	5	12	I	
Gout ...	I	I	...	2	...	
III.—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SEN- SES						
70. Encephalitis (not in- cluding Encephalitis Lethargica) ...	...	3	I	3	...	
71. Meningitis (not includ- ing Tuberculous Me- ningitis or Cerebro- spinal Meningitis) ...	...	12	12	12	...	
72. Locomotor Ataxia ...	10	16	3	26	8	
73. Other Affections of the Spinal Cord ...	...	3	I	3	...	
74. Apoplexy—	...	I	...	I	...	
(a) Hæmorrhage ...	...	22	17	22	I	
(b) Embolism ...	...	I	...	I	...	
(c) Thrombosis ...	...	4	2	4	...	
75. Paralysis—						
(a) Hemiplegia ...	46	112	14	158	51	
(b) Other Paralyzes	29	94	10	123	34	
76. General Paralysis of the Insane ...	...	I	...	I	...	
77. Other forms of Mental Alienation ...	731	839	121	1,570	776	
<i>Carried forward</i> ...	2,851	30,675	3,744	33,526	3,090	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	2,851	30,675	3,744	33,526	3,090	
III.—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES.— (Continued)						
78. Epilepsy ...	7	40	3	47	3	
79. Eclampsia, Convulsions (non-puerperal) 5 years or over ...	...	12	6	12	...	
80. Infantile Convulsions	1	20	14	21	...	
81. Chorea ...	...	4	1	4	1	
82. A.—Hysteria ...	1	27	...	28	...	
B.—Neuritis ...	16	164	...	180	9	
C.—Neurasthenia ...	1	24	...	25	...	
83. Cerebral Softening ...	...	9	7	9	...	
84. Other affections of the Nervous System	12	166	7	178	7	
85. Affections of the Or- gans of Vision— (a) Diseases of the Eye ...	43	278	...	321	33	
(b) Conjunctivitis ...	22	667	...	689	12	
(c) Trachoma ...	4	35	...	39	3	
(d) Tumours of the Eye ...	...	5	...	5	...	
(e) Other affections of the Eye ...	90	244	...	334	102	
86. Affections of the Ear or Mastoid Sinus ...	8	147	1	155	5	
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM						
87. Pericarditis ...	...	22	17	22	...	
88. Acute Endocarditis or Myocarditis ...	2	76	57	78	3	
89. Angina Pectoris ...	...	2	...	2	...	
90. Other Diseases of the Heart—	...	1	1	1	...	
(a) Valvular—	5	28	9	33	2	
Mitral ...	12	94	31	106	7	
Aortic ...	5	78	45	83	7	
Tricuspid ...	...	1	...	1	...	
Pulmonary ...	...	...	...	...	...
(b) Myocarditis ...	1	93	56	94	3	
<i>Carried forward</i> ...	3,081	32,912	3,999	35,993	3,287	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total Cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	3,081	32,912	3,999	35,993	3,287	
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM.— (Continued)						
91. Diseases of the Arteries— ...						
(a) Aneurism ...	...	15	2	15	3	
(b) Arterio-Sclerosis ...	5	41	18	46	...	
(c) Other diseases ...	...	21	4	21	2	
92. Embolism or Thrombosis (non-cerebral) ...	...	2	1	2	1	
93. Diseases of the Veins—						
Hæmorrhoids ...	6	141	...	147	3	
Varicose Veins ...	1	6	...	7	...	
Phlebitis ...	...	9	2	9	...	
94. Diseases of the Lymphatic System—						
Lymphangitis ...	...	8	...	8	2	
Lymphadenitis, Bubo (non-specific) ...	19	299	1	318	15	
95. Hæmorrhage of undetermined cause ...	...	1	1	1	...	
96. Other affections of the Circulatory System ...	...	18	9	18	...	
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM						
97. Diseases of the Nasal Passages—						
Adenoids ...	...	3	...	3	...	
Polypus ...	...	27	...	27	...	
Rhinitis ...	1	14	...	15	...	
Coryza ...	...	14	...	14	...	
Other Diseases ...	1	171	...	172	...	
98. Affections of the Larynx—						
Laryngitis ...	1	75	...	76	3	
99. Bronchitis—						
(a) Acute ...	...	35	...	36	1	
(b) Chronic ...	27	1,614	7	1,641	42	
100. Broncho-Pneumonia ...	36	492	8	528	36	
101. Pneumonia—	13	561	311	574	7	
(a) Lobar ...	...	...	...	...	...
(b) Unclassified ...	21	1,266	775	1,287	33	
	2	62	19	64	5	
<i>Carried forward</i> ...	3,215	37,807	5,157	41,022	3,440	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at end of 1926	YEARLY TOTAL		Total Cases Treated	Remaining in Hospital at end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	3,215	37,807	5,157	41,022	3,440	
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM— (Continued)						
102. Pleurisy, Empyema ...	5	168	31	173	15	
103. Congestion of the Lungs ...	...	2	1	2	...	
104. Gangrene of the Lungs ...	...	7	7	7	...	
105. Asthma ...	23	429	2	452	34	
106. Pulmonary Emphysema ...	1	5	...	6	...	
107. Other affections of the Lungs— Pulmonary Spirochæ- tosis ...	...	23	7	23	1	
	
VI.—DISEASES OF THE DI- GESTIVE SYSTEM						
108. A.—Diseases of Teeth or Gums— Caries, Pyorr- hœa, etc. ...	...	158	6	158	4	
B.—Other affections of the Mouth— Stomatitis ...	1	25	...	26	...	
Glossitis, etc. ...	...	19	4	19	2	
109. Affections of the Pha- rynix or Tonsils— Tonsilitis ...	2	261	...	263	4	
Pharyngitis ...	4	60	...	64	...	
110. Affections of the Œso- phagus ...	...	7	...	7	2	
111. A.—Ulcer of the Sto- mach ...	5	100	24	105	4	
B.—Ulcer of the Duo- denum ...	...	27	6	27	2	
112. Other affections of the Stomach— Gastritis ...	2	1	...	3	...	
Dyspepsia, etc. ...	13	268	1	281	13	
113. Diarrhœa and Enteri- tis— Under two years ...	2	409	77	411	6	
114. Diarrhœa and Enteri- tis— Two years and over Colitis ...	10	707	60	717	16	
Ulceration ...	11	245	13	256	9	
114A. Sprue ...	...	2	1	2	...	
	...	8	4	8	1	
<i>Carried forward</i> ...	3,296	40,940	5,401	44,236	3,553	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	3,296	40,940	5,401	44,236	3,553	
VI.—DISEASES OF THE DIGESTIVE SYSTEM.— (Continued)						
115. Ankylostomiasis ...	133	3,736	100	3,869	143	
116. Diseases due to Intestinal Parasites—						
(a) Cestoda (Tænia) ...	...	4	...	4	...	
(b) Trematoda (Flukes) ...	...	...	...	...	...
(c) Nematoda (other than Ankylostoma)—						
Ascaris ...	13	826	...	839	39	
Trichocephalus dispar ...	...	9	...	9	...	
Trichina ...	...	...	...	...	...
Dracunculus ...	...	8	...	8	...	
Strongylus ...	...	...	...	...	...
Oxyuris ...	...	...	...	...	...
(d) Coccidia ...	...	...	...	...	...
(e) Other parasites ...	...	6	...	6	...	
(f) Unclassified ...	...	...	...	...	...
117. Appendicitis ...	11	219	12	230	4	
118. Hernia ...	10	157	4	167	12	
119. A.—Affections of the Anus, Fistula, etc.	15	242	6	257	14	
B.—Other affections of the Intestines—						
Intestinal Obstruction ...	...	8	4	8	...	
Enteroptosis ...	...	5	...	5	...	
Constipation ...	4	254	1	258	...	
Intestinal Colic ...	1	224	...	225	1	
120. Acute Yellow Atrophy of the Liver ...	...	1	1	1	...	
121. Hydatid of the Liver ...	...	...	...	...	...
122. Cirrhosis of the Liver—	3	32	10	35	5	
(a) Alcoholic ...	...	13	6	13	1	
(b) Other forms ...	15	162	42	177	15	
123. Biliary Calculus ...	...	3	...	3	...	
124. Other affections of the Liver—						
Abscess ...	2	54	14	56	4	
Hepatitis ...	2	41	3	43	...	
Cholecystitis C h o -						
langitis ...	1	56	9	57	4	
Jaundice ...	1	50	3	51	2	
<i>Carried forward</i> ...	3,507	47,050	5,616	50,557	3,797	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	3,507	47,050	5,616	50,557	3,797	
VI.—DISEASES OF THE DIGESTIVE SYSTEM.— (Continued)						
125. Diseases of the Pan- creas ...	...	7	4	7	2	
126. Peritonitis (of unknown cause) ...	I	71	59	72	2	
127. Other affections of the Digestive System ...	11	168	25	179	8	
VII.—DISEASES OF THE GE- NITO-URINARY SYSTEM (NON-VENEREAL)						
128. Acute Nephritis ...	16	503	75	519	30	
129. Chronic ...	30	557	197	587	34	
130. A.—Chyluria ...	...	9	..	9	...	
B.—Schistosomiasis ...	...	2	2	2	...	
131. Other affections of the Kidneys— Pyelitis, etc. ...	5	67	7	72	2	
132. Urinary Calculus ...	5	26	...	31	...	
133. Diseases of the Blad- der— Cystitis ...	I	58	7	59	I	
134. Diseases of the Ure- thra— (a) Stricture ...	I	73	I	74	2	
(b) Other ...	3	144	3	147	10	
135. Diseases of the Pros- tate— Hypertrophy ...	...	2	...	2	...	
Prostatitis, etc. ...	...	11	...	11	...	
136. Diseases (non-venereal) of the Genital Organs of Man— Epididymitis ...	2	40	...	42	I	
Orchitis ...	3	75	...	78	I	
Hydrocele ...	7	132	...	139	12	
Ulcer of Penis, etc. ...	5	143	I	148	7	
137. Cysts or other non- malignant Tumours of the Ovaries ...	I	23	...	24	3	
138. Salpingitis— Abscess of the Pelvis ...	...	12	2	12	...	
	...	13	I	13	...	
<i>Carried forward</i> ...	3,598	49,186	6,000	52,784	3,912	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	3,598	49,186	6,000	52,784	3,912	
VII.—DISEASES OF THE GENITO-URINARY SYSTEM (NON- VENEREAL.—(<i>Contd.</i>)						
139. Uterine Tumours (non-malignant) ...	...	I	...	I	...	
140. Uterine Hæmorrhage (non-puerperal) ...	...	2	...	2	...	
141. A.—Metritis ...	...	11	I	11	I	
B.—Other affections of the Female Genital Organs—	4	79	2	83	4	
Displacements of Uterus ...	...	24	I	24	I	
Amenorrhœa ...	...	3	...	3	...	
Dysmenorrhœa ...	...	18	...	18	...	
Leucorrhœa ...	I	24	...	25	...	
142. Diseases of the Breast (non-puerperal)—						
Mastitis ...	I	10	...	11	...	
Abscess of Breast ...	...	17	...	17	5	
VIII.—PUERPERAL STATE						
143. A.—Normal Labour ...	14	630	...	644	7	
B. Accidents of Pregnancy—						
(a) Abortion ...	I	75	...	76	I	
(b) Ectopic Gestation ...	...	5	...	5	I	
(c) Other accidents of Pregnancy ...	...	139	I	139	3	
144. Puerperal Hæmorrhage ...	...	2	2	2	...	
145. Other accidents of Parturition ...	12	132	3	144	7	
146. Puerperal Septicæmia ...	2	21	7	23	...	
147. Phlegmasia Dolens ...	...	...	...	...	...
148. Puerperal Eclampsia ...	...	12	5	12	...	
149. Sequelæ of Labour ...	...	2	I	2	...	
150. Puerperal affections of the Breast ...	...	2	...	2	...	
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES						
151. Gangrene ...	3	40	14	43	5	
<i>Carried forward</i> ...	3,636	50,435	6,037	54,071	3,947	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	3,636	50,435	6,037	54,071	3,947	
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES —(Continued)						
152. Boil—	...	30	1	30	...	
Carbuncle ...	1	109	4	110	4	
153. Abscess—	38	1,044	4	1,082	60	
Whitlow ...	1	118	...	119	4	
Cellulitis ...	25	364	35	389	27	
154. A.—Tinea ...	1	61	...	62	4	
B.—Scabies ...	17	785	...	802	18	
155. Other Diseases of the Skin—	4	118	...	122	3	
Erythema ...	...	5	...	5	...	
Urticaria ...	1	20	...	21	...	
Eczema ...	9	405	...	414	13	
Herpes ...	...	22	...	22	...	
Psoriasis ...	1	5	...	6	...	
Elephantiasis ...	1	30	...	31	1	
Myiasis ...	...	4	...	4	1	
Dermatitis ...	2	79	...	81	7	
Cutaneous Leishmaniasis ...	...	1	...	1	...	
Ulcers ...	310	4,042	3	4,352	335	
X.—DISEASES OF BONES AND ORGANS OF LOCOMOTION (OTHER THAN TUBERCULOUS)						
156. Diseases of Bones—						
Osteitis ...	4	26	...	30	3	
157. Diseases of Joints ...	1	33	...	34	...	
Arthritis ...	28	408	2	436	17	
Synovitis ...	2	58	...	60	1	
158. Other Diseases of Bones or Organs of Locomotion ...	20	182	5	202	10	
XI.—MALFORMATIONS						
159. Malformations—						
Hydrocephalus ...	...	2	2	2	...	
Hypospadias ...	...	1	...	1	...	
Spina, Bifida, etc. ...	1	40	10	41	...	
<i>Carried forward</i> ...	4,103	58,427	6,103	62,530	4,455	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	4,103	58,427	6,103	62,530	4,455	
XII.—DISEASES OF INFANCY						
160. Congenital Debility ...	...	4	1	4	...	
161. Premature Birth ...	...	18	13	18	...	
162. Other affections of Infancy ...	...	22	9	22	...	
163. Infant neglect (infants of three months or over) ...	...	...	...	...	...
XIII.—AFFECTIONS OF OLD AGE						
164. Senility ...	32	220	67	252	32	
Senile Dementia ...	4	31	18	35	6	
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES						
165. Suicide by Poisoning ...	...	2	...	2	...	
166. Corrosive Poisoning (intentional) ...	...	3	2	3	...	
167. Suicide by Gas Poisoning ...	...	..	..	...	...
168. Suicide by Hanging or Strangulation ...	...	3	2	3	...	
169. Suicide by Drowning ...	1	4	...	5	...	
170. Suicide by Firearms ...	...	...	...	...	...
171. Suicide by cutting or stabbing Instruments ...	...	1	1	1	...	
172. Suicide by jumping from a height ...	...	...	...	...	...
173. Suicide by crushing ...	...	...	...	...	...
174. Other Suicides ...	...	8	4	8	...	
175. Food Poisoning ...	...	24	...	24	...	
176. Attacks of poisonous animals—						
Snake bite ...	...	12	...	12	1	
Insect bite ...	...	9	...	9	...	
177. Other accidental poisonings ...	...	67	6	67	1	
178. Burns (by Fire) ...	2	97	6	99	1	
179. Burns (other than by Fire) ...	4	169	11	173	15	
180. Suffocation (accidental) ...	...	3	2	3	...	
181. Poisoning by Gas (accidental) ...	...	...	...	...	...
182. Drowning (accidental) ...	...	1	...	1	...	
<i>Carried forward</i> ...	4,146	59,125	6,245	63,271	4,511	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward</i> ...	4,146	59,125	6,245	63,271	4,511	
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES. —(<i>Continued</i>)						
183. Wounds (by Firearms, war excepted) ...	2	123	23	125	3	
184. Wounds (by cutting or stabbing Instruments) ...	31	934	39	965	26	
185. Wounds (by Fall) ...	23	1,062	18	1,085	40	
186. Wounds (in Mines or Quarries) ...	...	3	...	3	...	
187. Wounds (by Machinery) ...	13	191	5	204	7	
188. Wounds (crushing, e.g. Motor Car, railway accidents, &c.) ...	30	810	18	840	35	
189. Injuries inflicted by Animals, Bites, Kicks, &c. ...	2	63	1	65	5	
190. Wounds inflicted on Active Service ...	...	199	...	199	2	
191. Executions of civilians by hangmen ...	...	...	...	...	...
192. A.—Over fatigue ...	...	2	1	2	...	
B.—Hunger or Thirst ...	...	1	1	1	...	
193. Exposure to Cold, Frost bite, &c ...	...	4	...	4	...	
194. Exposure to Heat— Heatstroke ...	...	...	...	...	...
Sunstroke ...	...	...	...	...	...
195. Lightning Stroke ...	...	...	...	...	...
196. Electric Shock ...	...	3	...	3	...	
197. Murder by Firearms ...	...	...	...	...	...
198. Murder by cutting or stabbing Instruments ...	...	...	...	...	...
199. Murder by other means ...	...	...	...	...	...
200. Infanticide (Murder of an infant under one year) ...	...	...	...	...	...
201. A.—Dislocation ...	2	39	1	41	2	
B.—Sprain ...	2	110	...	112	2	
C.—Fracture ...	45	877	121	922	55	
202. Other external injuries ...	16	695	...	711	8	
203. Deaths by Violence of unknown cause ...	...	...	...	...	...
<i>Carried forward</i> ...	4,312	64,241	6,473	68,553	4,696	

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—*Contd.*

DISEASES	Remaining in Hospital at the end of 1926	YEARLY TOTAL		Total cases Treated	Remaining in Hospital at the end of 1927	REMARKS
		Admissions	Deaths			
<i>Brought forward ...</i>	4,312	64,241	6,473	68,553	4,696	
XV.—ILL-DEFINED DISEASES						
204. Sudden Death (cause unknown) ...	...	I	I	1	...	
205. A.—Diseases not already specified or ill-defined—	8	704	22	712	27	
Ascites ...	...	I	...	1	...	
Œdema ...	..	2	...	2	...	
Asthenia, Marasmus, etc.	2	22	11	24	...	
Shock ...	...	6	4	6	...	
Pyrexia of uncertain Origin	18	898	4	916	22	
B.—Malingering ...	...	3	...	3	...	
C.—Observation ...	17	525	...	542	20	
XVI.—Diseases, the total of which have not caused						
10 deaths ...	3	60	...	63	2	
Accompanying Patients	5	582	...	587	8	
Contacts ...	...	265	...	265	...	
Total ...	4,365	67,310	6,515	71,675	4,775	

